ELECTRICAL REVIEW

[ILLUSTRATED.]

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An Electric Railway and Subway Combined.

Mr. Julius M. Jagel, of 55 Gold street, this city, has invented a system which is called the electric and pneumatic subway and railway combined. It consists of a continuous row of iron boxes or cases joined together by bolts, the joints having waterproof packing. Provision is made for expansion and contraction of metal by elongated bolt-holes. At the upper edge of case are openings at suitable distances to admit the wires and cables, which are also made water-tight. Should any moisture get in the case, there are drains underneath to take off same to sewers. These cases can be made of any desirable size, and make a very firm railroad sleeper. There is also at each opening a continuous wire rope for the purpose of drawing the cables to the next opening. Pneumatic tubes can also be laid in these conduits, and the cables and wires if desired, can be laid in asphaltum or other material. The engravings show improved conduits, with opening on side of rail, and new cable system for running wires through openings.

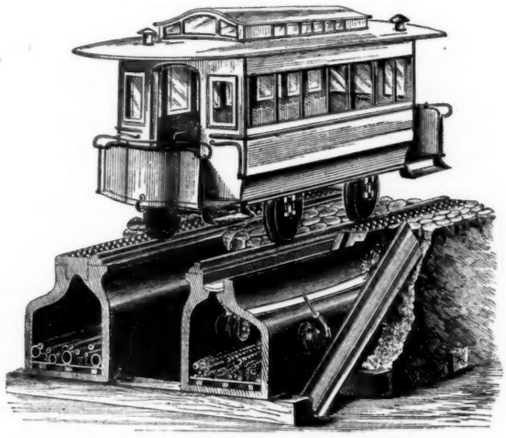
Telegraph Rivalry in Canada.

The announcement that the Canadian Pacific Railway Company had engaged a well-known telegraph manager to take charge of their commercial telegraph system has caused considerable stir throughout Canada, says a Montreal correspondent. Although it was pretty generally known that this company had constructed a line of telegraph along their entire length, yet the importance of the fact has been completely overshadowed by the magnitude of the great railway itself. Now that attention has been directed to the telegraph facilities that the company possess, the public are awakening to the fact that the company have an asset the value of which very few have heretofore realized. It has been the custom in Canada for railway companies to transfer their telegraph privileges to the regular telegraph companies, thus virtually giving away valuable franchises. Mr. Van Horne, the Vice-President and General Manager of the Canadian Pacific Railway Company, however, from the outset has steadily refused to part with any part of his road's telegraph rights, so that to-day his company owns an unbroken line of telegraph extending from Montreal to the Pacific Ocean, a distance of 2,895 miles. There are now being erected, for commercial purposes only (in addition to the wires that are in operation for the railway business), two number six wires from Montreal to Winnipeg, a distance of 1,450 miles. From Winnipeg to British Columbia additional facilities for commercial business are also being provided, so that on the opening of the company's system to the public Montreal and the Pacific Coast will be in direct and constant communication.

The public, in contemplating the great possibilities that the opening up of this new transcontinental route offers, have in a measure lost sight of the telegraphic privileges that the company possess in the older parts of Canada. They have in operation at the present moment a line of telegraph controlled by themselves connecting the four leading cities of the Dominion viz.: Montreal, Quebec, Ottawa and Toronto. They also own, leading out from Toronto into the garden of Canada, lines of telegraph that tap such important towns as Galt, Woodstock, Ingersoll, and St. Thomas in one direction, and Brampton, Orangeville, Elora, Fergus, Mount Forrest, and Owen Sound in another direction. A few hundred miles of extra lines built out from the various points along their road would reach every important town in Ontario, and would give a connection with the United States systems at Detroit and Buffalo.

Oil Under Boilers.

The use of petroleum and of the residuum of its distillation, has been extensively used for the steam marine on the Caspian, and on the railways in South-eastern Russia, but the price of petroleum in the eastern portion of the United States has been too great to enable its economic use in competition with coal, although there have been numerous devices for its combustion under boilers, which have been successful in the mechanical aspects. A locomotive has been made which burns naphtha, which is vaporized by steam jets, but for numerous reasons it has never been adopted by the railways, although the absence of cinders and smoke and the ease with which the generation of steam can be controlled, render this class of fuel particularly adapted to locomotives. The recent development of the petroleum deposits on the Pacific coast of the United States, has opened anew its application for the generation of steam. The Central Pacific Railway has introduced the use of petroleum upon its steam vessels at its western terminus at Oakland, near San Francisco, with excellent results. As in the Russian system, the oil is blown into the fire-box by steam jets, and the cost of oil on one of their vessels, the Thoroughfare, for five months is said to be 56 per cent. of the cost of coal on the same steamer for the corresponding five months of last year. As a matter of general practical application, it is found that 100 United States gallons (80 imperial gallons) of petroleum, costing $4, is equivalent for steam purposes to one ton of coal costing $7. Therefore its use is rendered advantageous by the abnormally high prices of coal for fuel, and the discovery of beds of coal in accessible localities in these States, would render the use of petroleum for steam purposes as far out of the question as in the Eastern States, where the deposit of coal and of petroleum are equally accessible.



An Electric Railway and Wire Conduit Combined.

Heavy Transaction in Copper.

The Lake Superior companies have made contracts within the past few days with home manufacturers for a large amount of ingot copper for delivery next year, says the New York *Bulletin*. The exact quantity has not yet been fixed; but, according to good authority, it will not vary much from 10,000,000 pounds and is likely to be over rather than under that amount. A uniform price of 11½ cents for the various deliveries was made. This is fully ½ cent advance upon what moderate lots were selling a month ago. Some time previous to this movement, companies not under the control of the Calumet & Hecla Mining Company took contracts for 1,000,000 pounds at 11 cents. Though materially higher than last year's contracts (which were made at prices based upon that of Chili bars in London at stated periods of each month) the terms are satisfactory to consumers, as they serve to keep the market for manufactured goods from the disturbances to which it was previously subjected by London speculation in the raw material. The stockholders of the lake companies, moreover, should be gratified by the change in the method of selling, as the contracts will realize some $200,000 more than those for the corresponding period last year.

—— Mr. Otto Fahnehjelm, of Sweden, invented a combination of a suitable substance and flame for producing light from an incandescent solid. The flame of water-gas has intense heating power. An ordinary fantail burner is used, the flame from which passed between two rows of vertical teeth composed of magnesia, baked and moulded, with starch, under high pressure. The teeth, when heated, become beautifully luminous, and the light shows colors correctly, and can be used for photography.

England's Lack of Electrical Enterprise.

The readiness with which the "universal Yankee nation" accepts the most radical innovations and utilizes the discoveries of science and the triumphs of invention is a source of never-ceasing wonder to John Bull, whose reverence for everything that is old and distrust of all that is new are traditional. The multifarious uses to which the telephone is put, not only in the great cities and large towns of the older and more populous States, but in villages and hamlets on the remote frontier, and on the vast cattle ranches and wheat farms of the west, are a revelation to our British cousins when they come among us. Indeed, it is difficult even for an American to realize that but eight or ten years ago this instrument, which has proved such a potent enemy to time and space, and has become such an indispensable adjunct to the business and social life of a great majority of our people, was but the unfledged bantling of the scientist's brain, the curiosity of the inventor's workshop. Nor is it easier to realize that the electric light, which has driven darkness from the streets of a thousand towns scattered from Maine to California, and has been introduced into churches, theaters, and dwelling-houses at points far distant from the great centers of population, was, so recently as 1880, a novelty even in New York and Chicago. Scarcely ten years ago Gray and Bell, Brush and Edison were studying in their closets and experimenting in their laboratories upon the problem of directing the electric currents into these new channels and exacting fresh services from the invisible but sleepless handmaiden of the race; to-day the fruits of their genius and industry are the common property of mankind, and, in the United States, at least, the telephone and the electric light seem to possess the charm of novelty in a hardly greater degree than gunpowder and the lucifer match.

In England, on the contrary, these inventions have made comparatively little headway, although Johnny Bull seems to be finally awakening to some conception of their importance and utility. A leading London newspaper in a recent issue expresses satisfaction at the largely-increased employment of the telephone during the past three years, while admitting that in England "more, perhaps in any other country, the progress of telephony has been slow." Telephone exchanges, we are told, exist in the chief cities, and number among their subscribers all the merchants, stock-brokers, and manufacturers whose business is of respectable dimensions. "In Sheffield or Birmingham the iron merchant has a wire connecting his office with his works, and in Liverpool the ship-owner is by the same means in immediate connection with his wharfinger, it may be miles away. As for the stock-broker, every important client whose tastes may tempt him into the troubled waters of Capel court takes care to instantly 'ring up' the man by whose agency a fortune may in a minute be won—or lost." But this appears to be about the extent to which the telephone is used in England. The journal already quoted says that very few Englishmen have their residences connected with their places of business, and that the telephone serves a

dozen ends in America which are as yet undreamt of in England. According to the same authority the electric light is not gaining in favor very rapidly, either for public or private uses. Only two or three theaters in London are lighted by electricity, and in the "provinces" the incandescent system is scarcely known.

We are assured, however, that there are "very good reasons" for the slow progress which these inventions have made in England, and that "one can readily see why they have not been more generally used." Specifications are not given as to the electric light, but the great obstacle to the general employment of the telephone has been "the tardy acceptance by the government of the fact that here was a discovery on the progress of which they were bound to make their calculations." Another obstacle lay in the fact that "in England men are not fond of doing business at the high-measure speed of Americans," and that when they leave their offices or counting-rooms for the day they want to be free from the cares of business until their return on the following morning. Other impediments mentioned are the cheapness of telegraph facilities and the low wages paid clerks, which render "labor-saving apparatus like the telephone less essential than in America." But it was hardly necessary to enter so much into detail. The causes mentioned for the unpopularity of the telephone and the electric light in England doubtless exist, but they are only manifestations of the pig-headed conservatism of its people, which prevents them from "knowing a good thing," when they see it, or stepping out of the beaten ruts until their transatlantic kinsmen have shown them the way. —*Chicago Times.*

* * The Brush-Swan Electric Company of Auburn, capital $1,000,000, was incorporated Monday.

* * A building was in process of erection opposite a public building in Washington City. One of the clerks who had been looking out of the window for some time said to another clerk who was reading a newspaper:

"I have been watching that workman over there for half an-hour, and he has not done a lick of work in all that time. I wonder what he gets paid for?"

Just about the same time the workman remarked to a fellow-workman;

"Just look at that Government clerk over there. He hasn't done anything except look out of the window for the last half-hour. No wonder the country is going to the dogs."

* * Miss Ora Misner, aged twenty-one years, daughter of George Misner, a well-known farmer residing at Big Indian a small hamlet a few miles from Kingston, N. Y., took an ounce of laudanum. The parents of the girl went at once to the railway station to telegraph Dr. Schley, at Pine Hill, three miles west, to come quickly. The operator working the Big Indian wire in the main office of the Western Union Telegraph Company, in New York, having overheard the message, summoning Dr. Schley, asked the Big Indian operator about the case. Learning the situation of affairs, and appreciating the necessity of immediate medical treatment, he consulted with two brother operators, on duty at the time, who had graduated from a medical college in New York. These two operators then told the Big Indian operator what remedies should be applied and gave full direction as to treatment. Following their directions powerful emetics were administered, which proved effective. They also prescribed vigorous rubbing and whipping with small twigs to keep the girl awake Dr. Schley, who arrived an hour later, said the girl's life could not have been saved had not the New York operators prescribed for her. Miss Misner is now pronounced to be out of danger. Her reason for attempting suicide is unknown, but it is supposed that it resulted from a love affair. There are said to be a number of ex-doctors and medical students in the employ of the Western Union in this city.

The Discovery of Electro-Magnetism.

By H. Lutteman, Engineer and Commissary of Swedish Telegraphs.

In the *London Review* for July 14, 1883, appears an article from *Cosmos les Mondes*, wherein Dr. Tommasi submits to the managing committee of the then existing Vienna Exhibition these two questions:

"Had Oersted any knowledge of the experiment of Rogmanosi when he published his discovery of electro-magnetism?

"Have any other *savants* taken part in his discovery?"

Having found no answer in the *Review* to these questions, it may be permitted me to recall them, and to try to clear them up, more especially the first one.

I will set up the assertion that Oersted *had* knowledge of Rogmanosi's experiment; but that he, notwithstanding, is the true and only author of the discovery of electro-magnetism. Moreover, I will insist that Rogmanosi has never, as far as I can see from accessible sources, carried out any experiment proving the dynamic effect of the electric circuit upon the magnetic needle. To that assertion, I will add the opinion that Rogmanosi only worked with static effects of the current.

My assertions are concluded from the following works:

1. "Historie de la Physique et de la Chimie," of F. Hoefer, 1802, page 209, cited by Dr. Tommasi.

2. Professor Tzarn's work on "Magnetism," published at Paris, 1804, in which he cites Rogmanosi's and T. Majon's experiments in Geneva.

3. Oersted's own description of his discovery of electro magnetism, made in Copenhagen, the 21st of July, 1820.

It is here necessary to recite word for word some sentences from these three works. The translation of Hoefer's description of Rogmanosi's experiment runs in the following words:

"After having made a Volta's pile with discs of copper and zinc, between which were interposed circles of flannel, saturated with dilute ammonia, the author (Rogmanosi) attached to the pile itself a silver wire broken in different places like a chain. He then took an ordinary magnetic needle, disposed in the manner of a naval compass, and let it into a prismatic axis of wood. After having removed the glass cover, he placed the needle upon an insulator of glass, close to the battery. He then seized the chain, *taking it by a glass tube, and applied its end to the magnetic needle.* After contact some seconds, the needle deviated several degrees from its polar position.

"On removing the chain, the needle preserved the direction thus impressed upon it; on applying the chain anew, it again deviated a little and preserved the position in which it was left, so that its polarity seemed entirely destroyed."

Rogmanosi, to restore it, proceeds as follows: "He pressed with both hands, between the thumb and the forefinger, the edge of the insulated box, but avoiding any shaking, and held it for some moments. The needle was then moving slowly and resuming its polarity, *not all at once, but in successive pulsations*, like the second hand of a watch."

Having read this description of Rogmanosi's experiment, we at once see that he did not work with a closed circuit. If he had done so, why should he have taken such scrupulous precaution to place the magnetic needle upon an insulator of glass, a measure which was quite superfluous in working with the dynamic effects of the current? Why did he catch the wire (observe the singular number; the other wire was probably put to earth) with a glass tube, if he did not make his experiments with static electricity? That he wished to give the needle a static charge is evident, and it can be concluded therefrom that, to restore its polarity, he desired to make a discharge with the thumb and the forefinger. He also found that the needle did not return at once into the magnetic meridian, but in successive pulsations after several discharges. This circumstance is a further proof that Rogmanosi worked with a static charge and with an open circuit.

I beg the reader to bear especially in mind the expression "open circuit," because it is as I will further show, against this technical term and its supposed effects, that Oersted devoted his dissertation, and he consequently must have had knowledge of the treatises of Rogmanosi and other *savants* on this matter.

Rogmanosi thus only observed the static effect of the current, and not the dynamic.

Before we go into Oersted's description of his discovery, we have reason to examine what Tzarn, at Paris, in 1804, wrote about Rogmanosi's and Majon's experiments:

"D'après les observations de Rogmanosi, physicien de Trente, l'aiguille déjà aimantée et que l'on soumet ainsi au courant galvanique eprouve une déclinaison; et d'après de celles de J. Majon, savant chémiste de Gènes les aiguilles non aimantées aquierent par ce moyen, une sorte de polarité magnetique."

We see, therefore, that Majon repeated Rogmanosi's experiment, and besides, that he used a non magnetic needle, to which he succeeded in giving polarity. Whether these needles were of iron or any other material capable of becoming magnetic, is not known. That he did not transform the non-magnetic needle into a magnetic one, is evident from the fact that Tzarn uses such a reserved and vague expression as "*a sort of polarity*"

Probably Majon did not desire to give his non-magnetic needle such a heavy charge as Rogmanosi succeeded in giving the magnetic one, and, of course, he only speaks about "a sort of polarity." That this polarity was the result of an electric charge, we have all reason to suppose, because here is nothing which indicates that Majon has used any other method in applying the circuit than that employed by Rogmanosi, who applied *the one end* of the silver wire *to the needle.*

From the descriptions, I think it must be seen that neither Rogmanosi or Majon worked with a closed circuit, which must have been the condition to gain the honor of the discovery of electro-magnetism.

We will now let Oersted speak, in order to show that he must have had some knowledge of Rogmanosi's experiments, and of those of other *savants*, with the open circuit, and to that end it is sufficient to make a verbatim copy of the first two sentences from Oersted's description of his discovery:

"Experiments on the Effect of Electric Action on the Magnetic Needle.

"The first experiments on the subject which I undertake to illustrate, were set on foot in the classes for electricity, galvanism and magnetism, which were held by me in the winter just passed. By these experiments it seemed to be shown that the magnetic needle was moved from its position by the help of a galvanic apparatus, and that, *when the galvanic circuit was closed, but not when open, as certain very celebrated physicists in vain attempted several years ago.*"

Having read this description by Oersted himself, we see at once that he must have had knowledge of the experiments of Rogmanosi and other *savants* who worked with an open circuit. That these *savants* never succeeded in producing what Oersted did—viz., the magnetizing effect of the closed circuit, seems to me to be the prime motive for Oersted's publication of his scientific circular, which was sent to the most celebrated physicists of that time. Therefore, he also in his discovery accentuates the expressions *circuito galvanico, chiuso, non aperto*, and he has hereby himself answered the question whether he or any other is the discoverer of electro magnetism.

To us Scandinavian people who knew Oersted, the religious philosopher, author of the "Soul of Nature," and the man to whom the laws of nature mere reason's laws, it is impossible to suppose that this man should have published as his own a discovery which was not his.

I will finish these lines by an extract from the biography of Oersted by the Super-Commissary of War at Copenhagen, C. L. Madsen.

"Eminent as a scholar, he was equally great as a man; modest and lenient in his judgment of others, strict with regard to himself; benevolent, always ready to help others with advice and deed; himself truthful in the highest degree, he demanded truthfulness from others as their first duty."

In such a light Oersted stands to us Scandinavians, and he will keep his glory as long as there is no reason to deprive him of it.

Electrical Railways.

The Van Depoele Company, of Chicago, have three miles of road running at South Bend, Ind. The horses have been taken off, and the cars are run entirely by electricity, the electricity being generated by water power. The cars are running in all directions, and passing each other, and running off at right angles from the main track—all by the same generator. This company also have trains of three cars, running three-quarters of a mile on the exhibition ground at New Orleans. They are also running two miles, in Minneapolis, Minn., taking the place of the steam trains on the M. L. & M. Railway, and carrying all the passengers into the city. They are putting in operation over two miles of road at Detroit, Mich., and four miles at Montgomery, Ala.

Taking off Hides by Electricity.

The introduction of improved labor-saving appliance in the slaughtering industry of the country has been so slow and of so unimportant a nature, that it is with a certain degree of satisfaction, we record the invention of what the patentee calls an "electric siding knife," for taking off animal skins, without injury to either the hide or carcass.

The inventor, Mr. L. Newgass, who for a number of years has had charge of the Fairbank Canning Co's, immense slaughter house, (and who, by the way, has made the study of electricity, the principal occupation of his spare time for the last five years), understanding the depreciation in the value of hides, from what is known in the trade as scores, snips and cuts, in other words, where a number of men are employed by a large firm, it is impossible at all times to get skilled and careful butchers, especially during the busy season, hence the number of damaged hides turned out annually, by such a house as the Fairbank Canning Co., though small in proportion to the total amount shipped, is a sufficient loss (from dockage by the buyers of the hides), to make the new discovery one of great value to the firm of Nelson, Morris & Co.; further, we have no hesitancy in saying from what we have seen of the "electric siding knife," that the value of hides will be increased from one-half to one cent. a pound, as the fleshy side is left as smooth and even as the inner side of sheep pelt. The siding knife, like all good inventions is simplicity itself, being virtually nothing more than a slight alteration of the Edison incandescent or arc light, with the glass bulb removed. The knife, in construction, resembles very much the receiver employed by the telephone companies, and like it, has a double set of covered or insulated wires attached to the butt end of the handle, connecting through the body of same to the cutting, or more properly the burning, edge, or the wire which is composed of platinum. The current is entirely under control of the butcher, who after opening the hide in the usual way with an ordinary knife, turns on the current and commences removing the hide with long, quick sweeps of the sider. The principle is that of burning, as the platinum edge is brought to an intense white heat, yet said edge is so arranged and protected with non-conducting shields, that it is impossible to injure either the hide or the carcass; in fact, the hide seems to be as it were, torn or pulled off by some unexplained force of this wonderful agent, electricity, and further, it has been demonstrated beyond a doubt, that the meat holds its color better and longer, this being accounted for, by the fact that the pores are closed up by the action of the current, which seems to leave a thin and transparent coating over the entire side; another advantage is that the beef after leaving the chill room, never sweats or weeps as under the old system of taking off. The patent is controlled by the company who employed Mr. Newgass, the patentee.

Electricity at the Salpetriere.

At the Salpetriere, electricity constitutes one of the chief elements in the treatment of the sick. In fact, the service of electro-therapy has existed here for a long time. Its creation, in 1877, was due to the initiative of Professor Charcot, and its organization was the work of Dr. R. Vigouroux, who has continued to direct it ever since its foundation. The patients, as their numbers are called, pass from the reception room into the room for treatment shown in the engraving. Most of them take a seat upon two rows of insulating stools, where they receive electricity from the two machines seen in the middle of the room. They are thus, in the first place, submitted, for a length of time varying with the case, to what is called an "electric bath." Then the operator, provided with special instruments of various forms, called "exciters," makes such an application to each person as the case requires. As soon as a patient has been thus electrified, he gives way to another. In this way the sixteen stools are constantly occupied. The number of persons electrified at each sitting is 180, on an average. Those who are not to sit upon the stools go over to the electro-therapeutic table (shown on the left), where they receive electric applications of a different kind. The total number of persons treated at each sitting may be estimated as 200.

There are two categories of patients, viz., the inmates of the Salpetriere, and those from the outside, who come solely for electrical treatment. The inmates, of both sexes, belong for the most part to Prof. Charcot's wards. As for the outsiders, many of them come from afar, by rail, boat, etc. Numbers of these persons have a more well-to-do appearance than the usual patients of hospitals.

The original and important element of this organization consists in the use of the electric machines. These latter, which had nearly ceased being used in medicine, have been very successfully applied by Dr. Vigouroux in the simultaneous treatment of a large number of sick persons. Without them, that is to say, with the ordinary processes of eletrotherapeutics, the most active physician cannot treat more than twenty persons per sitting, which is an insufficient number. The electric machine solves the problem of the extension of the benefits of the electricity to an indefinite number of patients.

Dr. Vigouroux has been kind enough to inform us as to the results of this electric treatment. They are, according to him, of the most satisfactory character. We believe with most physicians, that nervous affections are nearly the only ones amenable to electricity. This, according to Dr. Vigouroux, is too narrow a view to take of it. At the Salpetriere, almost all complaints are represented in the patients who succeed each other on the stools. In Dr. Vigouroux's opinion, electricity, especially static, must be considered as a stimulant and a regulator of the general nutrition. But it is not our object to write a medical criticism, and we shall confine ourselves to the descriptive side of the subject under consideration. Those persons ignorant of medicine, who accompanied us, were especially struck by the indifferent attitude of the patients sitting upon the insulating stools. One had unfolded a newspaper, another was doing crocheting, a baby was asleep upon its mother's knees; and, in curious contrast, the hair of each member of this quiet party was standing on end, through the effect of the electricity. The calmness diminished slightly, when the operator drew some sparks with a metallic ball; but, positively, the treatment appeared to us very mild, and was certainly borne very willingly by all these patients. Several, who were very infirm, were seated in large arm-chairs or lying upon stretchers, placed upon the insulating supports.

The electric machines are, as shown in the figure, inclosed in glass cases that preserve them against dust and dampness. They are of the Carre system, but arranged horizontally. Dr. Vigouroux is now having others constructed on a new plan. The manner in which they are set in motion merits special mention. A Gramme motor, located in the room, actuates the shaft, on which there are distinct pulleys that receive two belts for the electric machines, and one for a laboratory Gramme machine. The current is furnished by a dynamo, situated about 600 yards off, alongside of the large steam-engine of the laundry. This transmission of power was put in by the house Breguet.

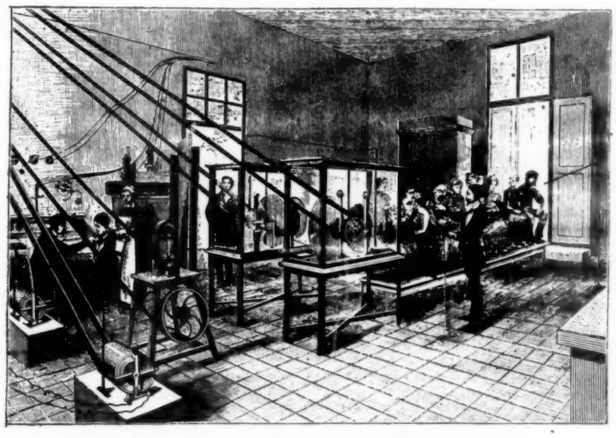
A small laboratory, alongside of the room for electric treatment, serves for experiments or researches.—*La Nature.*

The Copper Situation.

The recent pool sale of 12,000,000 pounds of copper, at 11½ cents, arouses a hope on the part of copper producers that 12 cents is to be reached shortly.

There is very little money for any but favored mines like the Calumet and Hecla in taking out copper and selling it at 11½ cents, delivered in New York. The freight from the mines cannot be counted less than ¾ cent per lb. by railroad at this season of the year, which brings the price down to 10¾ cents at the mine.

Take the case of a mine like the Huron, for example, in the Lake Superior region. It produced 126 tons, or 252,000 pounds of 80 per cent. copper in November, or about 100 tons of ingot, upon which, after deducting the cost of smelting, the net profit was about 1 per cent. per pound.



Room for Electric Treatment at the Salpetriere.

The rock from which this copper was produced contained but about 1 per cent. of copper as mined. A few years ago such ores could not have been worked. The Calumet and Hecla used to hire its stamping done for it, and paid $5.50 for what is now done at a cost of 42 cents.—*Boston Commercial Bulletin.*

* * A cultivated gentleman of French descent residing at Gallipolis, Ohio, who has been an invalid for several years, has just received a patent for an invention of more than ordinary merit and of peculiar character. It excites, says an exchange, the wonder and admiration of all who behold it. Many declare it the equal, in general utility, of the sewing machine or telephone. It is perfectly wonderful in its operation, and yet so simple in its action that a child can learn to use it in a few minutes. It consists of a pair of scales which announce with unerring accuracy the value of any number of tons, pounds or ounces at any price. For instance, a ham is placed on the scales. It weighs 12¼ pounds, and the price is 12½ cents per pound. A sliding weight is moved along the scale beam until the ham is balanced. In the notch where this weight stops will be found the worth of meat in dollars and cents to a fraction. Again, suppose a grocer is asked for 50 pounds of tea. The price is 78 cents. One indicator is set at 50, the amount wanted, the other at 78, the price of the tea. Tea is poured into the scoop until the scale is balanced, when the quantity of tea is found to be as correct as if several minutes had been consumed in making the calculation.

An Underground Electric Railway.

The New York District Railway Company was incorporated in the office of the Secretary of State, at Albany, on Monday. Its projectors propose a rapid conveyance of passengers from the Battery, to and beyond the Harlem River, and contemplate an underground system under Broadway and Madison avenue, thence under the Harlem River to a point where connection can be made with the New York Central and Hudson River, the New York, New Haven and Hartford, the Harlem and the New York City and Northern railways, and the suburban rapid transit. A branch line, to be known as the Western division, is to run from Madison square to Fifty-ninth street at Eight avenue, following the line of Broadway. The only cross-town branch provided in the plans is through Fourteenth street, extending from Second to Ninth avenue. Electricity is to be the motive power, and the tunnels are to be illuminated with electric lights.

The Duke's Electric Launch.

In June last, Mr. Reckenzaun had the privilege of taking the Duke of Bedford, accompanied by Lord Sudeley, for a cruise in the electric launch Australia, the duke's magnificent steam yacht Northumbria being at the time anchored off Gravesend. His grace was so pleased with the performance of the Australia that he decided to order a boat of similar design, but of more elegant appearance, and the Electrical Power Storage Company was intrusted with the construction of the propelling apparatus of this new vessel, which is some three feet longer than the Australia; the internal arrangements, however, are very similar. Twenty-nine E. P. S. accumulators are placed in a box in the center of the boat, this box serving as a seat for passengers; the cells actuate a "Reckenzaun" motor, and the speed obtained is of the average rate of six knots per hour for 4½ hours. The accumulators of this boat serve also for lighting the yacht when the electric launch is suspended from the davits, and the cells are charged from the dynamo which usually lights the Northumbria. The official trial took place at Westminster, in the presence of numerous spectators. Mr. Reckenzaun has at this moment several designs of electric boats in progress which will embody further substantial improvements. One of these is being executed to the order of the Italian Government, and a second for an Indian prince; the former is for war purposes and the latter for pleasure. The prince's launch is to be fitted most luxuriously, and electrically lighted, even the fans being actuated by electricity.

—— Mr. William Wilson, of London, will retire into strict privacy for a period of five years, and anticipates being fully occupied during that period in work for the national benefit. The cause which has immediately led to this proceeding on his part was the belief in the mind of the magistrate that it would conduce to the general good were Mr. Wilson for a time prevented from obtaining further sums of money from boys and young men, under the pretence that he will secure them employment with an electric lighting company.

—— The Utica (N. Y.) Council, notwithstanding the protests of the citizens, has adopted a resolution ordering the clerk to notifying the Central New York Electric Light and Power Company that the city will not require electric lights after January 1st.

—— "Has the introduction of the electric lights in hotels and houses hurt your business?" was asked of a dealer in matches. "Oh, dear, no," he replied. "At first sight it would seem to do so, as no matches are used with the electric lights; but there are other advantages which make up for that loss. You must have seen frequently smokers trying, absent-mindedly, to light their cigars or cigarettes at the electric light, and, of course, they can't do it. If it had been a gas jet, they would have had no trouble. The electric light forces them to use matches, which they would not have used otherwise. It takes only one match to light a gas jet at which, perhaps, a dozen cigars will be lighted later on."

—— One evening last week, five minutes before time for lighting, the Jacksonville (Fla.) Electric Light Company tested their wires, and they were found to be in perfect working condition, but when the time for lighting arrived, and the machinery was put in motion, it was found that the circuit had been broken. A party of four or five men were set immediately to work to find where the trouble was, but did not succeed until about nine o'clock, when it was discovered that the wires had been cut by some unknown party. The necessary repairs were speedily made, and the current was again turned on, with the usual satisfactory result. The company will pay a reward of $200 for the arrest and conviction of the villain who cut the wire.

—— Step by step the march of electricity advances, every week an advance forward is made. Electric lighting made its first public show as a commercial article in 1878, only eight years ago. Now we have arc lights by the thousand and incandescent lamps by the hundred thousand. There are nearly 2,000 arc lamps in the city of Boston alone. The three electric companies there have not a spare lamp to sell. The public do not seem to notice the gradual advance being made by electric motors for running elevated and horse railroad, but it is now a sure thing of the future that electric motors will be a success and only a question of time and economy, when all elevated and horse railroads will be run by electricity, also the present steam railroads. It is coming down to a question of economy. Arc lights that formerly cost forty cents a night to run, now only cost one-half of that sum. Dynamos will eventually sell for one half of the present price. What will the next twenty-five and fifty years provide in electricity?—*Boston Journal of Commerce.*

—— An incandescent electric light, worked by a battery possessing a reasonable degree of portability, has been successfully applied to lantern illumination. At a recent meeting of the English Camera Club, the secretary exhibited an application of the electric light which, in that particular respect, has been frequently attempted before, but never successfully so. The batteries occupied a box, rather under 2 feet in length and half that width, upon which a pair of lanterns was erected. This box protected two cells, and in these were immersed a number of plates of zinc and carbon, the mechanical arrangement being such as to provide for their being lifted quite out of the fluid and again immersed at pleasure. Each lantern was fitted with a somewhat small incandescent lamp, and when, upon pressing a button, the circuit was completed, the carbon filament enclosed instantly responded by emitting a powerful light. This light, while inferior to bat produced by oxyhydrogen, was of sufficient intensity to serve every requirement in parlor demonstration; and although its exhibition partook of a tentative character, yet the results were of an exceedingly satisfactory nature

Electrical Review.

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We invite correspondence from Electricians, Inventors and the Telegraph and Telephone fraternity and those engaged in Electric Lighting on matters pertaining to electrical and scientific subjects, and all facts of special interest in connection therewith.

We extend to manufacturers of electrical apparatus an invitation to send to this office any and all facts concerning their business which will be of interest to the public. We make no charge for publishing news.

Subscribers can at any time have the mailing address of their paper changed by sending both old and new address.

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NEW YORK, JANUARY 9, 1886.

CONTENTS.

	PAGE
An Electric Railway and Subway Combined	1
Telegraph Rivalry in Canada	1
Oil Under Boilers	1
Heavy Transaction in Copper	1
England's Lack of Electrical Enterprise	1
The Discovery of Electro-Magnetism	2
Electrical Railways	2
Taking off Hides by Electricity	2
Electricity at the Salpetriere	3
The Copper Situation	3
An Underground Electric Railway	3
The Duke's Electric Launch	3
Editorial Notes	4
Subterranean Superstition in Spruce Street	4
General Western News	4
The Electric Organ in Animals	5
Long Electric Light Circuits	5
Electrical News from Our Texas Correspondent	5
An Iron Pole Line in Kansas	5
Telephonic News	6
The Telephone Caveat of Antonio Meucci	6
The American Telegraph and Cable Company	7
An Electric Safety Lamp for Miners	7
The Unburied Wires	7
The Telephone and the Queen of the Belgians	7
Telegraphic	7
Electrical and Scientific	8
A New Apparatus for the Estimation of Copper	8
A New Battery for Electric Lighting	8
Western Electric Light News	8
Electric Light News	9
Electrical Patents	10

Mr. H. P. Hungerford has assumed the management of the Eastern interests of the Electrical Supply Company, with headquarters at the well-known location on Dey Street, this city. He succeeds Mr. Theo. Mace, who has resigned to take charge of a new incandescent electric lamp. Mr. Hungerford is a capable gentleman, familiar with the electrical business, and all who belong to the electrical fraternity will receive a courteous welcome from him. His company has recently enlarged the factory at Ansonia, the increase of business demanding extended facilities for turning out work, which is secured by these improvements.

About sixteen hundred electric lights are now burning in Boston nightly.

It is evident that wise business principles prevail in the management of the Brush Electric Lighting Company, of Boston. On the 1st of the month, a dividend of $3 per share was declared, payable January 15. The announcement is made by the treasurer, Hugh O'Brien, who is the Mayor of the city of Boston.

The Armington & Sims Engine Company, of Providence, R. I., are doing a heavy business, having for some time past run their works night and day. They shipped fifty-one engines in November and December, and have about sixty orders now unfilled. Their engine is meeting with great success in the electric-lighting field.

At the annual meeting of the stockholders of the Baltimore and Ohio Telegraph Company of Massachusetts, held in Boston, Jan. 4th, the following Board of Directors was elected for the ensuing year: D. H. Bates, E. A. Leslie, E. C. M. Bunce, and C. F. Hutchinson. Mr. D. H. Bates was re-elected President and Mr. E. A. Leslie, Vice-President.

The telephonic communication, announced last year as having been established, by the United States Life-saving Corps, between nineteen stations on the New Jersey shore, has proved quite advantageous, and communication is now being extended to seven other stations on that coast, and also between fourteen others on the barren, white stretch of sand along North Carolina.

In the case of the American Bell Telephone Company against the Maryland Overland Telephone and Telegraph Company (Baxter patents), United States Circuit Court Judge Morris entered a final decree January 2, which perpetually enjoins the defendants from using the improvements patented by Mr. Bell. This is another decision that the Bell company may put on its long list of favorable decrees.

The National Electric Light Association is well organized. Its officers are men of force and earnestness, and they represent all sections of the country. The REVIEW hopes to see no change occur at the annual meeting in Baltimore, February 10th. In an organization of this nature, combining in such close relations technical and practical knowledge and experience, that apparently essential element of politics, known as "passing around" the offices, should not exist. The Committee on Permanent Organization at the first meeting, one year ago, in Chicago, built wisely and well, and there will be no mistake in continuing these officers—there might be in a change. The Association cannot fail to more rapidly grow in strength and influence if the same experienced hands are at the helm for another year. The members do not desire a change, we are informed, and the only question is, whether the present officers will consent to remain. Mr. J. F. Morrison, the president, has worked earnestly and faithfully for the advancement of the Association during the past year, and is a capable and impartial presiding officer. It is his wish to be relieved from the duties of position. We are confident, however, if he is assured that he is the choice of the members, and that the best success of the Association can be attained through his acceptance, that he will reconsider his decision. The other officers will then very naturally remain. The names of the officers are given below: President—J. F. Morrison, Baltimore. Vice-Presidents—H. M. Cleveland, Hartford, Conn.; J. H. Yarbrough, Nashville; E. R. Weeks, Kansas City. Secretary—A G. Rhinehard, Baltimore. Treasurer—Chas. Cooper, Brooklyn. Executive Committee—Geo. S. Bowen, Chicago; William Hochhausen, New York: Gilbert Donaldson, St. Paul; Frank Ridlon, Boston; John R. Fletcher, Dayton, O; and George O'Connor, New Orleans, and the officers above named.

SUBTERRANEAN SUPERSTITION IN SPRUCE STREET.

It is a favorite belief with many that a panacea for all the alleged ills that proceed from aerial electric wires is to be found in a general burial of the wires. Hence, when the negative and positive electric currents came together in the underground incandescent electric mains in Spruce street last week, and an explosion presumably of gas, resulted, it must have shattered the hopes of these people quite as completely as it shattered the iron pipes encasing the wires.

The explosion took place in the basement occupied by a newsdealer at No. 8 Spruce street early in the morning while the newsboys were folding their papers. Things were scattered around rather lively, and for a time it seemed as if all *sheol* were let loose, the belief prevailing that the Evil One had a hand in the affair. An account says:

"Suddenly there was a loud explosion, a flash of flame, and a very pronounced smell of scorched wood. Some of the startled newspaper folders rushed for the street, while others investigated the source of the noise and the flame. It was found that a section of the 1¼-inch iron pipe incasing the electric light conductors had been shattered into ribbons, and the copper conductors had been broken. The break in the pipe occurred just above the gas meter, where the pipe entered the building from the street. Neither the meter nor the gas pipe was disturbed. Some of the adjacent woodwork caught fire, but a few pailsful of water extinguished the flames."

Now, we do not speak of this to show that underground electric mains are in any sense dangerous, but only to point out, what is the fact, that accidents will occur to buried wires as well as to aerial wires. In fact, there is no mechanism which man can devise that is not subject, under peculiarly unfavorable conditions, to mishap. Hence it is absurd to insist, as many uninformed persons do, that only underground electric conductors are safe. Should we desire to make a special plea for aerial wires, and we have no such purpose at this time, it would not be a difficult task to show that they have many advantages over the underground system, not only in economy of service, which must be plain to all without argument, but also from the point of view of efficient service and freedom from mishap and miscarriage.

When we heard of this accident in Spruce street, to the underground incandescent wires, we took up the daily papers to read the glowing and imaginative reports which have always followed accidents to aerial electric mains, but singularly enough nothing was said. This was somewhat of a disappointment as well as a surprise, for the daily press is never so amusing as when it discusses an accident to electric light mains. In the case of accidents to the aerial wires, we have read of "tongues of electric flame, six feet long," doing all sorts of interesting and uncanny things, and once we read of a policeman who had received a terrible shock from striking a fallen arc wire with his (wooden) club, as if policemen, who can drink the kind of whiskey given to them gratis at the corner grog-shops without being shocked, could not stand all the electricity that can pass through a wooden club!

In the case in Spruce street we expected that some of the papers would have headlines like the following: "Terrible Electric Light Accident! The Underground Wires Explode! Sheets of electric flame—one observer (a careful man) says five feet long, and another gentleman who had been up all night, and was therefore thoroughly awake, says ten feet, dart about and encircle the newsboys!

But the papers said nothing. Even the *Times* preserved a deep, unfathomed lugubrious and owlish silence.

In Philadelphia it meets with public approval that the telephone and telegraph companies are to be given still further time to put their wires underground. If the threat to cut the overhead wires on January 1 had been carried out, the business of the city would have been paralyzed.

GENERAL WESTERN NEWS.

Mention was made in this department a few days since of the new Ball unipolar machines and agent here. By a slip of the pen the gentleman's name was given as Barnard, when like

"The flowers that bloom in the spring,"

that name has nothing to do with the case. The gentlemen's name is Raymond, and an apology is due him for the error.

Among other concessions by the city during the year are the privilege of placing arc or incandescent lamps on posts at the curb line, special permits for which are granted, under proper restriction, by the Commissioner of Public Works.

The late decision relative to side-walk areas, too, puts it within the power of parties desiring to run central plants to reach customers by branches from the conduits leading to blocks either side of the street, through these areas. The rights of the conduit company have been more definitely defined by their amended charter also. So that, take it all in all, the line is more distinctly drawn, and there will be less chance for misapprehension or misunderstanding than heretofore.

Mr. F. B. Converse, who has been a general traveling agent for the Thomson-Houston International Company, in Europe and elsewhere, has been several days in the city, on a vacation. Mr. Converse's travels in the electric light business have led him through much of Europe, and, by way of registry, he installed a plant of arc lights at Hernosand, Sweden, the most northwestern city of that cold clime, about 600 miles from North Cape. At Palermo, Sicily, he placed a plant of 100 arc and 500 incandescent lights, and, by way of variety, has done more or less peregrinating through Central and South America.

The Guatemalian Government is using a plant which is one of the largest, if not the largest, ever sold, consisting of 300 arc lights.

The combined arc and lime light which the Western Edison Company placed on McVicker's stage to illuminate the scenery of the Mikado, gave such perfect satisfaction that it has become a fixture, to be used when occasion requires. The lamp is so simple as to permit its being handled readily by almost any one, and so effective as to be a grand addition to the list of stage properties. It should have been mentioned that the light originated in the Edison's company's laboratory.

Mr. E. B. Chandler, of this city absented himself rather mysteriously a few days since, and on his return announced that he had "only been putting in a Gamewell fire-alarm telegraph at Traverse City, Michigan; that was all."

The circuit referred to includes seven boxes, a gong at the house of the chief engineer, and one at the water works. The number of the box is repeated for the information of the public by a whistle at the water works, which precludes the necessity of a tower bell, and subserves the same purpose. The water system is of the direct pumping variety.

Chandler was lately at Minneapolis changing the fire alarm lines from a four to a ten circuit repeater, the needs of the system having outgrown its capacity. Now, the best of fraternal feeling exists between him and the fire officials there. As correspondent of the *Western Fireman*, the assistant chief is constantly banging away at somebody in a good natured way. His latest is the following, in which "Chromo" Chandler and his two assistants, Murphy and Casey, are the principal characters. It is of that class of excerpts which belongs among the scraps in the "Archives of Judge Advocate Dam:"

"When 'Chromo' Chandler was in the city he left the following letter, which will explain itself:

"'The stupendous work of testing two circuits at one time has only been accomplishe

twice since the Christian era began. The first person to try this wonderful experiment was Brian Boru, the monarch of Ireland, who, immediately after the great battle of Clontarf, being anxious to ascertain if his fire-alarm was in good condition, sent out Cols. Murphy and Casey to make a thorough examination and forward their report to his headquarters at Devil's Gap, county Tipperary. Col. Murphy at once proceeded to cut out all the counties from the repeater but Cork and Mayo, and himself and Casey then turned in twelve rounds of 'mountain dew,' and sent in their report as directed, which was highly satisfactory to Brian Boru, who complimented them on the efficiency of the Fire Alarm Telegraph.'"

The County Commissioners are quibbling with reference to the plants lately placed by the United States Company in the five county buildings. No fault is found with the quality or amount of light, but the methods of wire stringing, the use of bronzed iron instead of brass arms for brackets, etc., have been criticised by the commissioners. *Per contra*, the company claims that the requirements of the contract have been fully answered in all respects, but agree to make everything satisfactory to the County Board. The claim that some of the lamps have failed, while these were guaranteed to burn 600 hours, is simply puerile. The placing of 1,200 or 1,500 lamps on a circuit will unavoidably include some few lamps which are imperfect. These, of course, are replaced by the company in all cases, and to weed these out of a plant, the only method is to run the lamps until the weak ones fail.

The electrical sensation of the moment is the wreath of lights surrounding the tower of the Board of Trade. Mr. E. A. Sperry, the inventor of the system which bears his name, early conceived the idea of illuminating the neighborhood of the Board of Trade by means of a circle of arc lights surrounding the tower, near the dome. Matters were in fair trim for the result aimed at when Mr. Sperry became ill, and the project temporarily abandoned. The matter was again brought to the front a few weeks since and the necessary support given to bring the matter to a close in the form of a contract for all-night lights every night for three years.

Mr. Sperry's company furnishes the lights, places and operates them. The Board of Trade furnishes the engine power, and the balance is made up by subscription. The total expense of the exhibit will be about $3,000 per annum, and the cost for the term of three years has been abundantly provided for.

Four iron trusses project from the upper portion of the tower at a height of about three hundred and fifteen feet from the roadway, each fourteen and a-half feet in length, in form of a horizontal cross. At the outer extremities of these arms, pulleys are attached, over which ¾ inch steel wire cables sheet home into the center of the tower, where they are handled by windlass power.

At the farther end of the cables they are attached to a circle of four-inch gas pipe running round the tower, twenty-nine feet in diameter to the outer edge of which the lamps, twenty in number, are securely bolted at intervals of about four seven-tenths feet This apparatus weighs about nineteen hundred pounds.

The wires are brought up through the tower to a point midway between the level where the lamps are in place, and the lower level, where they are trimmed. The object of this arrangement is to keep the wires tight as possible, when either extremity of perpendicular is reached.

All being in readiness, and the time announced for the first turn of the dynamo having arrived, at 5.30 P.M. on the 31st., a lady friend of Mr. Sperry's was requested to turn the switch, and the lights one after another, in quick succession, blazed out. The crowd on the streets below, over three hundred feet down, went wild with enthusiasm. Far up and down and across the building tops the light glanced and streamed, producing much the same sort of illumination we get from a full moon early in the evening, save that this light radiated from the center in all directions. The shadows cast were sharp and black, the light as clearly defined, steady and white. The illumination thus inaugurated for a period of three years, was a success from the start, and Mr. Sperry is entitled to much credit for the enterprising and thorough manner in which he has carried the whole matter to successful completion.

The after-birth muddle at Milwaukee, which at first seemed likely to endanger the life of the parent, is in a fair way now to permit the patient to recover. The journals of the 2d of January announce that arrangements are about concluded by which the whole matter will be satisfactorily arranged. Should these fall through, the probability is that the council will annul the entire ordinance, and start another structure on a different foundation, one that cannot be trifled with as this appears to have been.

The Electrical Supply Company will remove from their present quarters about the middle of this month to more spacious and convenient rooms at 171 Randolph. The ground floor and the cellar beneath will give them about four times the room they now have—a change which was rendered absolutely necessary to accommodate their rapidly increasing business, which has grown to dimensions far beyond what was anticipated when the company commenced doing business at its present locality.

The Central Union Telephone Company announces a dividend which will be paid on the 25th to all stockholders of record at the close of business on the 18th instant. This dividend, No. 8, is at the rate of six per cent. per annum, or $1.50 per share.

S. G. Lynch, at 144 La Salle street, gives the following telephone stock values:

Chicago	$375 @	$400
Central Union	51 @	53
Michigan	65 @	67
Iowa Union	18 @	20
Great Southern	25 @	30
Colorado	18 @	20
Rocky Mountain Bell	40 @	45
Mo. & Kas.	54 @	56
United	16 @	18
Cumberland	70 @	75
Wisconsin	110 @	112
Bell of Missouri	152 @	156

CHICAGO, Jan. 6, 1886.

The Electric Organ in Animals.

Prof. Du Bois-Reymond, according to *Nature*, has recently availed himself of good opportunities for studying the electric ray in the live state; and among several important facts elicited by him is that of irreciprocity of conduction in the electric organ. That is, when short currents are passed through the organ in the same direction as that of the animal's proper current, viz., from belly to back, and in the reverse direction, the conductivity in the former case is considerably greater. This irreciprocity begins to appear only when the current has acquired a certain strength; it increases with the strength, but more slowly. Both this irreciprocity and the small conductivity of the organ (which is considerably less than that sea water) are proved to be connected with the life of the animal; the former disappears and the latter increases in the case of spontaneous death. The former depends also on the duration of the current, diminishing with a continuous current. This phenomenon of irreciprocity appears to have the effect of strengthening the animal's current and so intensifying its physiological action in external space. The author's researches on the subject have been recently laid before the Berlin Academy.

Long Electric Light Circuits.

Editors Electrical Review:

In your issue of Dec. 12th you ask for information concerning long electric-light circuits.

The Rock Island County Brush Electric Light Co. have at Rock Island, Ill, a circuit 15 miles long, on which they are operating 50 arc lamps of 2,000 C. P. each. The line or circuit is arranged in two divisions and operated by one No. 8 Brush dynamo, either separately or jointly, as circumstances require, each division having a switch board at or near the dynamo. One division we call the tower circuit, comprising 11 towers 132 feet high. This circuit is constructed of No. 6 wire, Stubbs gauge, and carrying 25 double lamps.

The other division we call the store circuit on which we have 25 single lamps. The dynamo is driven by a walking-beam engine of 45 horse-power, making about 60 revolutions per minute, with countershafting that gives the armature a speed of 750 revolutions. This plant has been in successful operation for three years. It has also been a success financially.

We think this is the longest electric-light circuit in this country operated with one dynamo.

J. R. JOHNSTON.

Rock Island, Ill., Jan. 4th.

Electrical News from Our Texas Correspondent.

Editors Electrical Review:

This town takes its name from a rock that projects prominently into the river at this point, and was a sort of landmark for steamers, before Little Rock became the metropolis it now is. I say metropolis advisedly. Can any place, but a metropolis, boast of two telephone exchanges? That is the case here, and the opposition is a very lively one, at that, equaling the Bell Telephone Exchange, in the number of subscribers, if it does not in rates and service. The new company, the Pan Electric, commenced operations here about the 1st of November, and now have 300 subscribers, and, say, sixty are waiting for connections. The rates of the old company were $4 and $5; the new company made a reduction to $2 and $3 per month. The old company have lost about thirty subscribers, the say. I am also told by them that the subscribers who were loudest in their praise of the coming opposition, that was to give better service, are now waiting the end, having come to the conclusion that the new service isn't so good, after all, and the old will suit them. The fact is, the new company have no instruments to brag of. Either the transmitter is a poor one, or the receiver is useless; at any rate, their instruments, at their best, as we can suppose them to be, are not to be feared in competiton with the poorest Bell telephone service, when service alone is considered. But competition is competiton, in whatever form it comes, and the public are not intelligent enough to discriminate between good and bad, feeling happy to be relieved of the oppression of a monopoly. The opposition, to be a success, must have something better than they have here. By the way, Little Rock is the home of Attorney-General Garland.

The Baltimore and Ohio Telegraph Company reach here over the lines of the Arkansas Telegraph Company. During the construction of the latter company, the Iron Mountain Railroad Company, over whose right of way the Arkansas company had condemned a right of way (which is allowed in this State), had a gang of men follow up the work of the former company, and dig up poles as fast as the Arkansas company set them. Finally an injunction was obtained, restraining the Iron Mountain company, which was really the Western Union Company. The matter was carried to the Supreme Court for a settlement of the damages accruing to the Iron Mountain company, and came up a few days ago, when the Iron Mountain asked for a postponement.

The electric-lighting field here is a very uninviting one. The Brush company have a plant here. Gas is $4.50, and coal-oil takes the lead. Crops were poor, and the people, in consequence, are in the same condition. The prosperity of the country is regulated by the abundance of the cotton crop.

ANON.

Little Rock, Ark., Dec. 28, 1885.

An Iron Pole Line in Kansas.

The frequent loss of wooden poles by lightning, by prairie fires and by the innate cussedness of emigrants and teamsters in need of fire wood, determined Gen. Sup't. Smith, of the United Telephone Company, to try gas pipe as a substitute. That company has completed seventy miles of line built with black pipe of twenty-foot lengths and an inch and a half inside diameter, set four feet in the ground. The holes were bored with two-inch earth angurs, the poles being one and three-quarter inches outside diameter, besides the tarring, which was put on hot for a distance of five feet at one end. No special provision was made for holding the poles in position, except at corners, where they are guyed to anchor stubs driven in the ground. The wire used is hand-drawn copper, 103 pounds to the mile, and the appearance of the wire and poles is all that could be desired. The insulation is a wooden pin driven in the top of the pipe which carries a Cleveland paper insulator, and to which the line is tied with soft copper wire.

The line is a particularly quiet one, there being a notable absence of frying and sputtering noises, which is attributed to the insulation used. A comparison with a forty-mile line of glass insulation shows favorably to the paper insulator to a large degree.

The cost of the poles at St. Louis was $1.47, but the saving in railroad freight, hauling and labor, was sufficient to bring the cost below that of a wooden pole in that vicinity. A two-horse team can haul three miles of poles at a load on dry roads. The cost of tarring was 3½ cents each. The entire cost of the line was $76 per mile.

Supt. C. W. McDaniel gave personal supervision to the construction of the line, and its success is due to his skill.

The line connects the Exchanges at Wichita, Wellington and Winfield, works admirably from end to end, and although only a month's experience has been had, it shows to be a profitable investment.

—— At the last Novelties Exhibition of the Franklin Institute, the electric leather belting of Chas. A. Schiernan & Co., of this city, was awarded a diploma; and at the Annual Exhibition of the American Institute of this city, the same belting was awarded the bronze medal of superiority. This company manufactures a belt particularly adapted for severe work, and in the tests made above carried off the honors.

—— A chemical process for making carbon filaments for incandescent lamps is described by Mr. A. Smith in *Dingler's Polytechnischer*, J. 257, 338. Hydrogen chloride is passed through furfuraldehyde or fucusaldehyde, and a black liquid is obtained which is placed between two glass plates. From this liquid a thin layer of carbon separates after eight or ten hours, and the thickness of the layer is regulated by inserting wires between the plates. This layer is removed, cut into strips, and twisted, and heated to 100 deg. Cent. Afterwards these filaments are heated in closed crucibles through which a current of marsh gas is passed. Their electric resistance can be changed by the addition of 2½ per cent. of lamp-black to the furfuraldehyde. For the preparation of carbon rods for arc lamps finely powdered carbon is mixed with from 60 to 70 per cent. of furfuraldehyde, and the mixture subjected to powerful pressure in suitable moulds. The rods thus formed are exposed to the action of gaseous hydrogen chloride after which they are highly heated in closed crucibles covered with powdered carbon.

Telephonic News

⁂ Experiments are about to be made at Portsmouth, Eng., with the view of extending the use of the telephone in the dockyard, the electric shop being the central exchange.

⁂ The annual meeting of the Mo. & Kan. and United Telephone Companies will be held January 28th, at the office of the company in Kansas City, Mo.

⁂ Mr. Frank B. Knight, special agent of the American Bell Telephone, will make his headquarters at Austin, Texas, leaving for that point the first of the year.

⁂ Justice McArthur, of Washington, D. C., had a witness before him whose evidence was a conversation he had with a defendant over the telephone. The evidence was ruled out as not admissible.

⁂ Relating to the Soudan telegraphs, a telegram from Wady Halfa states that the telegraph to Kosbeh is open. The telegraph line South of Akasheh is cut, but heliographic communication has been established.

⁂ The chairman of Councils' Electric Committee, Philadelphia, has introduced a resolution in Select Council, extending the time for placing all telegraph, telephone, and electric light wires underground until January 1st, 1887.

⁂ It has been decided that on and after the 1st of January, 1886, the quota of subscription for each of the telephone exchanges (in Spain) mentioned in Articles 7 and 8 of the law of the 12th of August, 1884, shall be 300 pesetas ($30.00) per annum.

⁂ It is stated that Princess Victoria of Sweden has had the telephone installed between her residence and the royal chapel in the castle, as her health does not always permit of her leaving the house to attend Divine worship. Receivers are placed in various parts of the chapel, and the sound is transmitted very satisfactorily, so that the princess is enabled to follow and enjoy the service.

⁂ In England a special telephone set is used in the mines. It is composed of a Bell receiver, Blake transmitter, magneto ringer, and generator. The latter is in an air-tight compartment, to prevent any possibility of explosion of fire-damp by sparking. The whole set is contained in a portable box about 18 inches square. The great advantage of a magneto call for mining purposes, is that the ringer, which must necessarily be open, never sparks.

⁂ This month the Brooklyn Telephone Company will submit to the Subway Commission plans for a ten-mile extension of the underground wire system, taking in Fulton street from Raymond street to Bedford avenue, Court street, Myrtle avenue and other thoroughfares. General Manager Sargent says that everything is about ready to draw the cables through the boxes in the lower Fulton street route, but the weather may prevent the completion of the work before next spring.

⁂ The directors of the New England Telephone and Telegraph Company met in Boston Dec. 30th. The question of the reorganization of the company on the plan of reducing the capital stock, making a preferred stock and raising the necessary amount for construction purposes, was discussed, but no final action was taken. The meeting adjourned to the call of the president. The dividend, which the stockholders have been expecting for a long time, was not handled. The directors are reticent about what they intend to do.

⁂ The friends of underground wires at Harrisburgh, Pa., made another effort to secure the passage of a proper ordinance at the meeting of Councils recently. In Select Council, Mr. Mueller moved that the vote by which the underground-wire ordinance was defeated be reconsidered. As Mr. Mueller had voted with the minority, the president ruled that he was not competent to make such a motion, and then Mr. Martin, who was with the majority, made the motion. Then President Gorgas ruled that the motion was out of order, the ordinance having been indefinitely postponed. This having settled the matter of resurrecting the old ordinance, Dr. Fritchey moved that the Highway Committee be relieved of further consideration of the ordinance compelling all telegraph wires to be placed underground, and that it be reported at the next meeting, which was agreed to. In Common Council a joint resolution was passed compelling the Baltimore and Ohio Telegraph Company to remove its overhead cable within twenty days.

⁂ The decision in the case of the Edison patent, one of the principal patents owned by the Bell Telephone Company of Canada, has been given by the Deputy Minister of Agriculture in favor of the patentees. The Bell Company officials are reported as saying that this is quite enough for their purpose in suing infringers, and that they will at once push the cases now before the courts, and probably issue a fresh batch of writs at once if necessary. They say that nearly all the opposition companies and exchanges, little and big, which have been started during the opposition excitement by clever speculators, assisted by "long-headed" local capitalists have already been sold out by the Sheriff, or otherwise failed for various seasons not connected with the patents, but that they are determined to stamp out any remnants of infringements that may be discovered.

⁂ Without including the electric-light wires, the following is given as the statistics of the telephone and telegraph wires in New York and Brooklyn:

	New York.		B'klyn.
Western Union Telegraph Co. (actual)..	4,986	(estimated)	246
Gold and Stock Telegraph Co. (actual)..	415	"	15
Metropolitan Telephone and Telegraph Co. (estimated)..	7,900	"	420
New York and New Jersey Telephone Co.	..	"	3,150
United Lines Telegraph Co. (estimated).	250		..
United Lines District Telegraph (estimated).	175		..
Baltimore and Ohio Telegraph Co. (estimated).	500	"	120
Baltimore and Ohio District Telegraph (estimated).	240		..
American District Telegraph Co. (actual).	555	"	200
Other District Telegraphs (estimated).	500	"	290
Commercial Telegram Co. (estimated).	100	"	..
Fire Department (estimated).	1,000	"	240
Police Department (estimated).	60	"	100
Totals.	16,681		4,781

⁂ Judge Homer A. Nelson states that the arbitration between the Law Telegraph Company and the Metropolitan Telephone Company is at an end. He was president of the Law Company and gives the points of the controversy. The Law Company, which began as a telegraph company, entered the telephone field among the earliest of the New-York companies. They had a contract with the Bell Telephone Company for instruments. It provided that at the end of five years the Bell Company might elect to buy the property and business of the Law Company or to continue its leases. The time expired a year ago. The Metropolitan Company had meanwhile become the possessors by assignment of the rights of the Bell Company. They asked for an inventory of the Law property, saying that they elected to buy it. Mr. Nelson refused to give an inventory, but put in a claim based on the earnings of the company. After some controversy, the Metropolitan Company paid him $150,000 and were allowed to take possession of the property with a stipulation that the price to be paid should be settled by arbitration. This was done on January 9, 1884, when the leases expired. B. F. Tracy, H. F. Dimock and W. W. Johnson, acted as arbitrators and have decided to allow the Law Company $270,000. This is $120,000 additional to the amount already paid. The Metropolitan Company had a claim under one clause of the lease for some $25,000 or $30,000 which was put into court, but is now included in the arbitration settlement, and makes the real allowance about $300,000.

⁂ In giving judgment upholding the validity of the Edison telephone patent and dismissing the application to have it annulled, Dr. Tache, Deputy Minister of Agriculture for Canada, held that the charges of importation, non-manufacture and refusal to sell had not been proved as regards patents Nos. 8,026 of 1877, 9,922 of 1879, and 9,923 of the same date, issued to Thomas Alva Edison, and now owned by the Bell Telephone Company. He decided that the setting aside of Bell's patent last year for importation and refusal to sell did not affect the Edison patent, though both were owned by the same company. The voidance of one patent for telephones does not, in the Deputy Minister's opinion, entail voidance of another patent for telephones, because they stand as distinct combinations. Bell's patent was declared null and void by the Minister of Agriculture because there was ample proof of importation in forbidden time having taken place, to the notable detriment of home labor, and because there was sufficient proof of refusal to sell which amounted to non-manufacture, while in Edison's case there was no such proof as applied to any one of the three Edison patents. These several patents acquired by the Bell Company are all for the purpose of telephonic communication. They all make use of the same elements, but they are distinct combinations, and have a right to stand as separate inventions. This is a fundamental principle in patents in all countries, there being everywhere a great many patents of combinations for an entirely new art or mechanism. It is further declared that a patentee is within the meaning of the law in regard of his obligation to manufacture, when he has kept himself ready either to furnish the patented article or to sell the right of using, though it may be that not one single specimen of the article has been produced, and he may have voided his patent by refusal to sell, though his patents were in general use. The Bell Company, therefore, continue the telephone monopoly in Canada by means of Edison's patents.

The Telephone Caveat of Antonio Meucci.

As a matter of curiosity we give below the caveat of Antonio Meucci, the Italian who claims to have been the original inventor of the telephone. This caveat was filed December 28, 1871; renewed December 9, 1873; renewed December 15, 1873.

The following is a description of the invention sufficiently in detail for the purposes of this caveat:

I employ the well-known conducting effect of continuous metallic conductors as a medium for sound, and increase the effect by electrically insulating both the conductor and the parties who are communicating. It forms a speaking telegraph without the necessity for any hollow tube. I claim that a portion or the whole of the effect may be also realized by a corresponding arrangement with a metallic tube.

I believe that some metals will serve better than others, but propose to try all kinds of metals.

The system on which I propose to operate and calculated, consists in isolating two persons separated at considerable distances from each other by placing them upon glass insulators, employing glass, for example, at the feet of the chair or bench on which each sits, and putting them in communication by means of a telegraph wire. I believe it preferable to have the wire of a larger area than that ordinarily employed in the electric telegraph, but will experiment on this. Each of these persons holds to his mouth an instrument analogous to a speaking trumpet, in which the word may be easily pronounced and the sound concentrated upon the wire. Another instrument is also applied to the ears in order to receive the voice of the opposite party.

All these, to wit, the mouth utensil and the ear instrument, communicate to the wire at a short distance from the persons. The ear utensils being of a convex form, like a clock glass, enclose the whole exterior part of the ear, and make it easy and comfortable for the operator. The object is to bring distinctly to the hearing the words of the person at the opposite end of the telegraph.

To call attention, the party at the other end of the line may be warned by an electric telegraph signal or a series of them. The apparatus for this purpose and the skill in operating it need be much less than for the ordinary telegraphing.

When my sound telegraph is in operation, the parties should remain alone in their respective rooms, and every practicable precaution should be taken to have the surroundings perfectly quiet.

The closed mouth utensil or trumpet and the enclosing the persons also in a room alone both tend to prevent undue publicity to the communication. I think it will be easy by these means to prevent the communication being understood by any but the proper persons.

It may be found practicable to work with the person sending the messages insulated and with the person receiving it in free electrical communication with the ground. Or these conditions may possibly be reversed and still operate with some success. Both the conductors or utensils for mouth and ears should be—in fact, I may say, must be—metallic, and be so conditioned as to be good conductors of electricity.

I claim as my invention and desire to have considered as such for all the purposes of this caveat—

The new invention herein set forth in all its details, combinations and sub-combinations.

And more specifically, I claim—

First—A continuous sound-conductor electrically insulated.

Second—The same adapted for telegraphing by sound or for conversation between distant parties electrically insulated.

Third—The employment of a sound conductor which is also an electrical conductor, as a means of communication by sound between distant points.

Fourth—The same in combination with provisions for electrically insulating the sending and receiving parties.

Fifth—The mouth-piece or speaking-utensil in combination with an electrically insulating conductor.

Sixth—The ear-utensils or receiving-vessels adapted to apply upon the ears in combination with an electrically insulating sound-conductor.

Seventh—The entire system comprising the electrical and sound-conductor insulated and furnished with a mouth-piece and ear-pieces at each end, adapted to serve as specified.

In testimony whereof, I have hereunto set my name in presence of two subscribing witnesses. ANTONIO MEUCCI.

Witnesses:

SHIRLEY MCANDREW.
FRED'K HARPER.

.... William F. G. Shanks, a New York journalist, has arranged with Senator Conger, of Michigan, chairman of the committee, for an early hearing for his new telegraph scheme. Mr. Shanks says that a company with a capital of $5,000,000 is being formed, including New York and San Francisco capitalists and journalists, and that the company controls all the patents for the wires and machinery for this country and England. The company will build two wires to San Francisco within the next two years capable of accommodating the entire commercial correspondence between the two coasts, including English and Australian communications, practically shortening mail communication with the East and West by seven days' time, at a cost of not more than half a cent per word. The lowest present rates between San Francisco and New York are seven and a third cents per word. The preparation of dispatches for rapid transmission is so much simplified by new machinery, he claims, that merchants may prepare their telegraphic letters in their own ciphers at their offices, so that the privacy of communication will be as absolute as it is by mail. The great difficulty heretofore in machine telegraphy has been the securing of low resistance wires impervious to heat or cold and to galvanic action between the steel and copper of which they were made. This, it is stated, is entirely obviated by the new wire the company owns.

The American Telegraph and Cable Company.

There has been considerable inquiry of late regarding the exact condition of the American Telegraph and Cable Company's affairs and its relations to the Western Union Company. The cable company owns two cables, which were laid in 1881, and at a cost of about $7,000,000, and the company has a capital stock of $14,000,000, upon which the Western Union Company guarantees a dividend of 5 per cent. for fifty years. The company is a member of the cable pool, receiving 22½ per cent. of the pool receipts, against 48⅛ per cent. paid to the Anglo-American, 16⅜ per cent. paid to the Direct Cable Company, and 12½ per cent. paid to the French Cable Company. The cable company makes no report direct to its stockholders, what little it cares to divulge being made through the Western Union. The little that can be learned must be learned inferentially and by comparison with the known business of other cable companies in the pool. The recent action of the Stock Exchange in striking the American Cable Company's stock from the list, owing to a dispute about the technicalities of certification, has stimulated speculation as to the actual value of the stock aside from the Western Union's guarantee.

The outcome of these inquiries has not been particularly flattering, and some uneasiness has been expressed as to the solidity of the contract which the cable company holds from the Western Union. "That contract," said a stockholder of the cable company—a man as well versed in telegraphic affairs as any in the city—"is as binding as any contract ever made, and the report that it is so drawn that the Western Union can find a loophole of escape from it is, in my opinion, a report which has no foundation in fact. If ever a company was tightly bound to pay its guarantee it seems to me the Western Union is so bound, and the stockholders will secure their dividends even though their company is a source of loss to the Western Union of many thousands of dollars yearly, as it unquestionably is."

The assumption that the Gould cables are a drag upon the Western Union is based on figures officially given by the Direct Cable Company. For the half year ending in July last the Direct Company reported gross earnings of £36,106. Assuming that the business for the last six months of the year just ending will show its natural increase, as well as the increase due to the revival of business, their receipts may be put at £75,000 for the year or $375,000. This will represent 16⅜ per cent. of the pool receipts, which is the Direct Company's share. The Western Union Company as the lessee of the Gould cables receives 22½ per cent. of the pool receipts, which, using the Direct Company's figures as a basis of calculation would be £48,743, or $243,715 for the first six months of the year 1885, or £101,250 for the year, equivalent to $506,250. The operating expenses, aside from the repairs of cables, for the Direct Company's one cable in the first six months of the year were £17,206, or $86,000, or should the same rate hold good for the year, $172,000. The working expenses of the two Gould cables, outside of the expenses for repairs, and these have been very heavy during the year just closing, would be at a very low estimate $150,000, and will probably be much more.

The situation occupied by the company to its guarantor is, then, just this: It brings to the Western Union a gross revenue during the year now closing of $506,250. The Western Union pays out as against this receipt the guaranteed dividend of $700,000 on the capital stock and $150,000 for operating expenses, in addition to an unknown sum for repairs to the cables. Both cables were broken last February. The attempt made to find them in the winter had to be abandoned, and another attempt was made in the summer with success, the cables being again in use in September. Both attempts were, of course, at great expense. This was made apparent by Dr. Green, president of the Western Union Company, who in his recent report advising the reduction of dividends said th necessity for such reduction was due to extraordinary expenses incurred for litigated taxes—which so far as this State goes don't appear to have been paid yet—and for repairs to cables. As an offset against this deficit the Western Union Company has by its contract with the cable company a uniform income of two cents a word for every word transmitted through it. Even this additional income is not sufficient to wipe out the deficit between the receipts and the regular charges—dividends and operating expenses—by many thousand dollars.

With such a showing the American Telegraph and Cable Company shareholders are anything but satisfied. So far as can be ascertained there is no fund set aside as a renewal to be used in the construction of new cables when those now in use shall be worn out. Every other cable company has such a fund, based usually on the theory that the life of a cable will be but sixteen years. To the renewal fund there is yearly set aside, by some of them, 6 per cent. on the actual cost of the cable. The Direct and Anglo-American have large renewal funds; the American none at all apparently. Naturally, the stockholders of the latter company ask "What will become of us when our cables are worn out?" and "What will become of us when the Western Union guarantee expires, if it lives and continues to pay us dividends for fifty years?" A satisfactory answer has not been given. Active and formidable opposition in the cable business and the constantly and rapidly decreasing earnings of the Western Union Company have put these stockholders on the anxious seat. This is especially the case since rival cables have been projected and seem likely soon to be constructed.

The only source of consolation which the stockholders find is the fact that their cables are comparatively new and are known to be good ones, having been made by the Siemens Brothers, of London, who constructed the Direct, the French and the Mackay-Bennett cables. They have met with no more accidents than have befallen other cables, and in case of breakages which are repaired at any time within a year from the time of the breakage their lessees will receive their share of the pool receipts, in accordance with the provision of the pool agreement.

An Electric Safety Lamp for Miners.

A meeting of the North of England Institute of Mining and Mechanical Engineers was held in the Wood Memorial Hall, Newcastle, Eng., recently, when Mr. Joseph W. Swan exhibited portable electric safety-lamps for miners, and said that at a meeting of the institute, four years ago, a form of lamp, which required a separate supply of electricity to be conveyed to it through a flexible cord enclosing two wires, was shown. A member of the institute criticised the feature of the dependence of the light on an extraneous supply of electric power, and expressed the opinion that the value of the electric light in mines would be greatly enhanced if the lamp and the supply of electricity to it could be combined in one apparatus. The apparatus before them was a lamp and battery combined, capable of giving during ten or twelve hours twice or three times the light of a common safety-lamp. On first lighting it gives the light of two candles, and after ten hours about one candle and a-half. For regular mine working the cells were of lead and lead oxide. This kind of cell is a secondary cell. Another kind of cell can be used, composed of zinc and lead oxide, with a special view to the occasional employment of the lamp for exploration in vitiated air. This is a primary cell, and only requires filling with liquid to make it ready to give light. It will sometimes be convenient to have a duplicate lamp within the bull's eye, with a switch connection to enable either, but not both, to be lighted, so that in case a lamp should fail the miner will not be left in the dark. The speaker had hoped to have been able to show a fourth modification, in which there are only two cells, instead of seven, to light a lamp. By this arrangement the weight is diminished to between 5 lbs. and 6 lbs. Believing that a good light was the most important point to be gained, after safety, the electric lamp shown had been constructed to give two or three times the light of the ordinary lamps, and consequently it was heavier; in fact, weight was made subordinate to light. The apparatus could have been made much lighter if it had been permissible to employ a primary battery instead of a secondary one; but it appears to be only allowable to use a primary battery to meet sudden emergencies, and in those cases where there is no dynamo and no regular system in operation for charging secondary batteries. For mine exploration, where the air is very foul, as, for example, after an explosion, which has destroyed the ventilation of the mine, a lamp with a primary battery, in conjunction with a Fleuss breathing apparatus, will probably be found very useful. But as a substitute for the ordinary safety-lamp for general underground lighting, a battery which requires, each time it is used, to have the spent charge emptied out, and a fresh charge poured in, and which also requires frequent renewal of the positive plate of each cell, is impracticable. On the other hand, a secondary battery can be charged with even less trouble than attends the trimming of an oil lamp. Hundreds of lamps can be charged at a time and at very small cost. An engine developing an effective five-horse power, and a dynamo-electric machine, correspondingly small, would suffice to charge 300 lamps at one operation. A discussion followed the reading of the paper, in the course of which the president, Mr. G. Baker Forster, and others spoke in favor of the lamp. Mr. Forster said he had no objection to the lamp as to its construction, and the weight might be got over. Some of the speakers stated that one objection to Mr. Swan's lamp was that it could not be used in detecting the presence of foul air. Mr. Swan explained that he hoped soon to be able to add to his lamp an apparatus to detect foul air, and he had hopes of being able to reduce the weight of the lamp. On the motion of the President, seconded by Mr. Baker Forster, a vote of thanks was passed to Mr. Swan, who, in returning thanks, said that he felt very much encouraged by the way the meeting had received the lamp, and he would prosecute his experiments further, in the hope that at some future time—and perhaps not a very distant time—he would be able to show them a still further development of the lamp.

The Unburied Wires.

The telegraphic spider spreads
His web above the people's heads
For miles and miles.
On ugly poles that block the ways
The wires are hung, an endless maze,
And Cyrus smiles.

To beat a greedy, grasping crew,
The many vainly fight the few,
And water wins.
By legislators cheaply bought,
The public will is set at naught,
And Jay Gould grins.

The weeks and months and years go by,
And still the poles and wires defy
The Empire State.
And while a lame Commission halts
To seek a system free from faults,
The people wait.

Before another year can pass,
The poles of every style and class
Must feed the fires;
And we must hide beneath the stones,
Though Cyrus sighs and Jay Gould groans,
The web of wires.

—*N. Y. Daily World.*

The Telephone and the Queen of the Belgians.

The Queen of the Belgians has for a long time possessed a telephonic installation (on the Van Rysselberghe system) between her Palace of Laeken and La Monnaie Opera House. The other day the company were going through the score of the "Templiers," the new opera by Litolff, which is to be performed for the first time in Brussels. Her Majesty was listening to a magnificent duet in the piece, where the children of Phillippe le Bel and Enguerand de Marigny reveal their love for each other, when all of a sudden the telephone dropped from her hands. The talented leader of the orchestra, M. Dupont, finding occasion to admonish the chorus singers, had invoked the name of the Deity in a manner altogether foreign to courtly etiquette. The Queen made a formal complaint, and since that time everything has gone wrong at the opera house. Litolff threatens to retake his MS., and the managers of the theatre also threaten the cancelment of the'r contract. Beyond all this, the subscribers, now aware that the slightest word they utter will reach the royal ears, have abandoned the green-room and wings *en masse*.

TELEGRAPHIC

.... The men employed as lookouts in the Brooklyn City Hall and Fourteenth Ward belltowers are to be withdrawn. The Fourteenth Ward tower is to be sold, and the telegraphic fire-alarm system is now so far perfected that the lookouts can be put on other work.

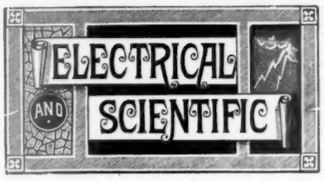
.... Telegraphic communication between the Mexican capital and Mazatlan has been reopened, owing to the energy of Director-General Islas, and the office at the latter place has been reorganized with a view to affording all possible convenience to the business public.

.... The telegraph system of the British islands, under the control of the Post Office, now amounts to 156,000 miles, and employs 17,000 instruments. The standard rate is twelve words for sixpence, address included. Press messages alone now average a million words a day.

.... After several weeks of active preparation for the event, the operating and general departments of the Baltimore and Ohio Telegraph Company have been safely transferred back to their old quarters, at 63 Broadway. The building, which was ruined by fire on the 4th of July, has been rebuilt, with special adaptation to the requirements of the telegraph business, and the operating room of the Baltimore and Ohio is now, in respect to size and to amount of business transacted, the third largest on this continent, though the company has been established in New York but two years. The growth of the company's business may be estimated by the significant fact that the space now required for its accommodation is double what was necessary at the time of the fire.

.... Judge Fisher, in the Circuit Court at Baltimore, delivered an opinion in the case of Day *versus* the Postal Telegraph and Cable Company, on the petition of the Postal Telegraph Company, of Baltimore city, for the possession of the poles, wires and other property in Maryland, claimed by the latter company and now in the possession of the New York corporation. The Court holds that the property, being leased to the New York corporation by the Maryland concern, the case is one of possession and not of equitable lien, as claimed by the former. The lease can be terminated at the will of either party. The Baltimore party claims that it has, by a resolution of the directors, ended the lease. But they only produce a copy of the alleged resolution When the original is produced in the minute book, the Court will pass an order giving the Baltimore corporation possession of the property.

... At a recent lecture before the Society of Arts, Professor Silvanus P. Thompson described a new automatic fire extinguisher of the American sprinkler pattern, which has been devised by Mr. Philip Jolin, of Bristol. It consists in closing the vertical orifice by which the water descends with a lead-topped ball valve held up against the supply orifice by a pair of springy metal levers which are clamped below by a fusible metal clamp. The clamp is in the form of a button made in two parts soldered at the edges right and left, and admitting the ends of the levers by an aperture which passes from top to bottom. This bottom is protected beneath a divided cone, which serves partly as a deflector for the water, partly as a protector to the clamping button, and partly as a collector of the hot ascending air. When the levers open the valve ball drops a short distance, and operates as a deflector. In another form of the apparatus a small truncated cone of fusible alloy holds the ball in its seat; and in a third the levers are held together by a double link of brass united by a wedge of alloy subjected only to compressing and shearing stresses.



* * The thirty arc lamps contracted for by the city of Burlington, Iowa, have been located by the council, and as there was not light enough to go around, the citizens are asking for more.

* * A cubic foot of gold weighs about 19,300 ounces, and gold is worth $20.67 per ounce. Silver is worth $1.29 per ounce, and a cubic foot weighs 10,500 ounces. Therefore, a cubic foot of gold would be worth $399,831, and silver $13,545.

* * Static electricity produced by a Carre machine has been used in Spain as a remedy for amblyopia (blunt, as opposed to clear, vision), produced by nicotine and hysteria. The susceptibility of the patient, especially in the case of women, should be carefully tested.

* * The latest door-knob device we have noticed is one operated by pressing on a button in the center of the knob, similar to the ordinary electric button, but the knob itself remains stationary. This is the invention of the New England Butt Company, of Providence.

* * A curious argument is advanced that the burglar, so far from being a curse, is a blessing to society. It is argued that the fact of his existence gives employment to many men as detectives, and that artisans and inventors are constantly employed in devising means of circumventing him.

* * Messrs. Schiernan & Co. have put an incandescent electric-light plant of 100 lamps in their leather belting establishment in this city. These gentlemen manufacture a belt which is in demand among electric-light people, and also appreciate the benefits of the electric light as an illuminant, and have adopted it for their own use.

* * Experiments in England show that by means of a small captive balloon and the incandescent electric light messages may be transmitted many miles. In the new system, with only the weight of a small electric lamp to sustain, instead of that of a man, an easily-managed balloon can be used. Instead of uncertain flag signals now employed, messages of any length could be sent by making and breaking the circuit containing the lamps.

* * Messrs. Rothschild Brothers have officially notified to the French Syndicate of Electricity that they have resolved to form a company for working the new system of transporting force by electricity. The result of the experiments between Creil and Paris, of which we gave an account in a recent issue, has, it is understood, led to this determination. The gentlemen at the head of the company are abundantly able to see that exhaustive tests are made, and having once become interested, will, no doubt, carry the work of the company to a successful issue.

* * A police official of Grand Rapids, Mich., says: "The street electric lights have been working very well for the past two weeks—in fact, better than for months. This is easily accounted for by one of the best rules ever adopted in the police department. Every night the patrolmen are required to report how the lights on their beats burn, if they go out and at what hours. A copy of these reports in schedule form is each morning given to the Electric Light Company. In this way the badly-working lamps have been culled out, and has proved the reporting system to pay well. Now we have only one or two reports a week, and all the lights are working beautifully, so far as we know."

* * The panoramic mirrors or silvered balls, frequently seen in gardens, are advocated by Mr. Hatt in a note to the French Academy of Sciences, for hellographic purposes, in preference to plane mirrors. Their advantage lies in the greater intensity of the luminous point, which can, therefore, be seen to greater distances. From experiments made by him during the past summer, he found that with a sphere of small diameter the image perceived at 15 kilometers with a lunette had a splendor comparable to that of a star of the second magnitude in a field feebly lighted. Such an image, which can be produced at little expense, would, he thinks, be useful in topographical triangulation.

* * The use of scientific terms is beautifully exemplified by the following description of a grindstone: "By means of a pedal attachment a fulcrummed lever converts a vertical reciprocating motion into a circular movement. The principal part of the machine is a disc, which revolves rapidly on a vertical plane. Power is applied through the axis of the disc, and when the speed of the driving arbor is moderate, the periphery of the machine is traveling at great velocity. Work is done on this periphery. Pieces of the hardest steel are, by mere impact, reduced to any shape the skillful operator desires."

* * The report of the Armington & Sims Engine Company of the year's business is remarkably encouraging, as indicating a substantial improvement over the preceding year. It is learned that the local manufactory was employing more hands and had materially increased its productive capacity, and yet was unable to meet the orders which were coming in with surprising rapidity in the closing month of the year from all parts of the country, notably in the West. The branch manufactories in Leeds, England, and Canada were turning out a large number of the best engines, principally for electric lighting companies, and there had been an active demand from manufacturers generally, which was a gratifying indication that there was a revival in general business confidently anticipated. The prices had ruled a little higher, raw material remaining about the same. The last six months in the year generally proved to be dull, but the establishment had been turning out on the average an engine per day, and would be tested to its utmost capacity for some time to come. A new departure had been experienced in the reception of orders to furnish power by electricity, and the Armington & Sims engines were in active demand. The company have also entered into contract to furnish engines of greatly increased horse-power, and pronounce the outlook for 1886 as most cheering and substantial.

A New Apparatus for the Estimation of Copper.*

By A. H. Low.

The apparatus described was devised as the result of numerous experiments upon the electrolytic method of determining copper, with a view to obtaining a more rapid and certain method than that generally used. It consists essentially of a simple electrotyping apparatus, with a parchment-paper diaphragm, instead of the porous clay cylinder. The outer cell is a glass beaker, 1¾ inches diameter, and 2½ inches high, and the inner one a piece of thick glass tube of somewhat smaller diameter, open at the ends. The lower end is ground slightly conical, and the parchment-paper diaphragm, is stretched across it, and clamped tight by a conical silver ring fitting on the ground part. The upper end of the tube is stopped with a wooden plug bored through the center to admit an amalgamated zinc rod which reaches nearly to the bottom, and there is also a groove in the side for the escape of gas. At the bottom of the beaker is placed a platinum electrode, consisting of a circular base plate as large as the beaker will admit, to which are united by means of gold solder, several concentric cylindrical walls, about ½ inch high. A strip of platinum, and a wire of the same metal attached to the outer wall, form the connection with the opposite electrode by means of a binding screw. The weight of the platinum electrode is about ¼ oz. troy, and its surface on both sides is about twenty square inches. The tube is surrounded by a spring ring of sheet iron, with two horizontal arms attached, which support it on the top of the beaker, the level of the bottom being adjusted by sliding the tube in the ring.

The solution from which the copper is to be deposited must be always of about the same nature; slightly acid, with sulphuric acid, and contain about forty-five grains of chlorate of potash. The volume should be sufficient to fill the beaker to a depth of ¾ in. When much iron is present in the substance under examination it should be previously removed, as it increases the electrical resistance. When the solution is prepared a mixture of sulphuric acid and water, in the proportion of 1 to 4, is poured into the inner tube to the depth of about 1 in., the zinc rod is inserted and connected with the platinum electrode, and the tube is lowered until the diaphragm just touches the surface of the copper solution. The deposition of the metal begins at once, and is finished in from one to two hours, according to the amount of copper present. The weight of the sample operated on is in all cases 1 gram. If towards the end of the operation the solution becomes too warm, the beaker must be cooled by placing it in water to prevent the acid liquid attacking the deposited copper and re-dissolving it. The operation is completed when bubbles of gas are given off from the platinum electrode, and a drop of the solution no longer discolors sulphuretted hydrogen water. The tube and platinum electrode are then lifted together without disconnecting them, and the latter is immersed in a beaker of water, while the former is returned to its place. The electrical connection is then broken, and the electrode, after being washed first with water and then with alcohol, is dried and weighed. For further use the deposited copper is dissolved off the platinum by nitric acid. Before setting aside the tube it is well rinsed with water to remove the acid from the diaphragm, which will last for several operations. Examples of the application of the method to different copper ore and furnace products are given, and the results are practically identical with those obtained by electrifying with a battery current. The time occupied in the operation was one hour and a half in each case.

* *Proceedings* of the Colorado Scientific Society. Abstracted in *Proceedings* of Institute of Civil Engineers.

A New Battery for Electric Lighting.

We are in receipt of the following information relating to the new depolarizing battery solution of the Chemical Electric Light and Power Company, of Boston, when used to maintain incandescent lamps. The claims of the company are as follows:

1 cell will maintain one 2½-candle lamp 150 to 200 hours.
2 cells will maintain one 5-candle lamp 150 to 200 hours.
4 cells will maintain two 5-candle lamps 150 to 200 hours.
6 cells will maintain three 5-candle lamps 150 to 200 hours.
9 cells will maintain one 8-candle lamp 150 to 200 hours.
10 cells will maintain two 8-candle lamps 150 to 200 hours.
12 cells will maintain four 8-candle lamps 150 to 200 hours.
16 cells will maintain one 16-candle lamp 150 to 200 hours.
20 cells will maintain two 16-candle lamps 150 to 200 hours.
24 cells will maintain five 16-candle lamps 150 to 200 hours.

These batteries are run with the above-named company's new solution, volta-pavia. They state that they have maintained lamps for 203 hours on one solution, classified as No. 2 B (four pounds of patent chemical to one gallon of liquid), without any renewal whatever, and they expect their No. 1 A will support lamps five hours per day for two months, as it is over 50 per cent. stronger. These remarkable results the company are willing to substantiate, and desire fair and thorough tests of their solution and batteries by the public.

WESTERN ELECTRIC LIGHT NEWS.

The Electric-light Mephistopheles held high carnival a few days since among the wires of the Fire-alarm Department in Louisville, Ky. The red-legged monster jumped on to one of the wires of the system, and thence made little excursions hither and thither until five fire-alarm boxes were entirely burned out and the connecting wires melted down. The result was fortunately not disastrous beyond the expense of renewals and repairs, as there did not happen to be any occasion for the apparatus until the system was again put in order—about five hours. The possibilities in a similar case can be imagined, and the remedy is, of course, to put the wires underground. This expedient, acknowledged on all hands to be the true and only outcome of the whole business, is only objected to, fought and argued against because of the expense; yet when done once it is done forever, and the reduced maintenance bills for all sorts of wires so placed, soon pays the original outlay.

Every day seems to develop some new phase in the action of electric-light currents. We used to hear a great deal about "the danger from high tension currents, such as the X. & Y. company uses, whereas in ours, the Z. & W. system, we use such low currents that they are perfectly safe." In the case below, the tension is of the lowest used for lighting, and the "well-behaved" variety of current, in this particular instance, seems either to have been associating with bad currents, or had started out to paint the town red on its own hook.

"Between 4 and 5 P. M. one afternoon a lot of men and boys who were folding newspapers in a basement, were startled by a sudden explosion, a flash, followed by a very pronounced smell of burned wood. The cause was discovered to be the bursting and shattering of an iron pipe which contained two electric light wires. The pipe was 1½ inches in diameter, supposed to be plenty strong enough for ordinary purposes, and the wires were assumed to be sufficiently insulated."

As the pipe was in the immediate vicinity of the gas meter, the first assumption was that the current had fired the gas. Investigation showed that the gas apparatus was unharmed. There was no end to the wise explanations offered, but the fact was finally settled upon that the insulation had in some mysterious manner failed of separating the two wires, the "low current" had been sufficient to volatilize the copper and the suddenly manufactured gases exploded the pipe. No damage was done, fortunately, as a pail or two of water at hand extinguished the flames.

Pittsburgh and Allegheny have lately had a curious experience with their natural gas illumination, and heating product. Sudden and severe cold weather checks the flow, and a few days since great inconvenience was suffered by those inhabitants who depend solely on gas for fuel. So too, many of the mills were compelled to shut down, because of the stoppage.

Some method of drying the gas by condensation or absorption will be necessary before the system can be called perfect. There is undoubtedly a larger per cent. of moisture in the natural than in the manufactured article, and the latter not unfrequently makes fun for consumers by the same process when the mercury gets well down in the thermometer.

The new scheme by which the underground people get along with the occupants of side-walk areas—going through these by permission, or around them by authority from the city, works well; or, perhaps it is better to say, has worked well, so far. But a new "bogy under the bed" has been discovered. The city, under the latest decision owns the side-walks as well as the street. Occupants are permitted certain privileges, and required to perform certain services, but have no right to require others to pay for the use of these spaces. The statement has obtained that the wire men have been com-

pelled to pay rental for rights of way through these areas, and it is becoming a mooted question whether such payments should not accrue to the city treasury, instead of going into a private "come-and-see me fund."

Beneath the sidewalks and through these areas, hereafter, nothing short of a metal-covered cable or wire will be permitted. These wires are, of course, as well as or better insulated than those only covered with fabric insulation, and the pipe is a necessity to protect the covering from mechanical abrasion. With the metal-covered wire, conductors may be made to occupy much less space than otherwise, and so inconvenience house-owners and occupants much less, while less liable to earth contact.

East St. Louis is after the telegraph people. Some time since the authorities ordered the poles removed within a certain limit. The poles didn't budge—the time has expired, and the authorities now purpose taking the matter in hand by removing them or knowing the reason why.

About a year ago the old trick of tapping the wires running to one of our most extensive pool rooms, was revived. By receiving the results of races in this way, before these were made generally public, the pool-trader's business was largely increased, but the losses were correspondingly magnified. The arrangement was finally broken up, but one of the parties whom an officer perfectly recognizes, has just been brought to grief for the theft of a suit of clothes. His protestations of life-long innocence and purity weighed but little in the scale with the officer's assertions, based upon a good memory of human faces.

Speaking of memory reminds me of an anecdote told of a railway telegraph superintendent, who is noted for the peculiar condition in which he keeps his battery-room, and who can boast of an excellent memory. In the battery-room one day, speaking of memory, a gentleman commenced asking, "With your good memory, can you——"

"Stop," said the Superintendent, "I know what you are going to ask. No, that is about the only thing I can't remember since I was a boy, away back in the long-dress and nursing-bottle days of telegraphy—I can't for the life of me recollect when that battery-room was cleared.

Two more places of amusement have become patrons of electric lighting. The home Van Depoele Company of the West Side have extended their plant to Desplaines street, and placed a half-dozen or so of arc lights on the Lyceum, and the Western Electric Company have done the same sort of work for Hooley's, where for some months gas has been endeavoring to rival the brighter light. Previous to that, electric lights had been used, but for some reason discontinued.

In accordance with the annual custom, the Amphitheatre of our County Hospital was filled on Christmas Eve with friends of the patients, and a large Christmas Tree, decorated with tinsel and colored paper, was filled with presents for the inmates of the institution. Among those present were several patients, some of these being brought in on beds and cribs. There were many on crutches, also. When the enjoyment was at its height, the tree unfortunately took fire, and owing to the imperfect arrangements for exit, many persons were injured. The heat was intense, and through inhaling the stifling air the lungs of several present were quite seriously affected. Limbs were broken in two or three instances and other comparatively minor injuries, singeing, blistering, &c., sustained, but so far no deaths have resulted. Among those present who were more or less injured, were the wife and daughter of M. C. Bullock, Esq., who years ago was a pioneer in electric lighting here, and introduced the Brush system in Chicago and other Western cities. Mrs. Bullock says that one or two more inhalations would have settled her fate.

There is often a laughable side to such occurrences, and this is no exception. In their fright and excitement, several patients who had come to the room on crutches were cured as by a miracle, and got off well together at the first tap of alarm, but forgot their crutches altogether in their haste to win the race. So, too, of others, who were confined to their cots. Fear lent health and vigor, and these, as well as the lame, were much better very suddenly, when the danger of being cremated seemed imminent. It is safe to say that there will be no more illuminated christmas trees at the Hospital.

There is great need of a fool-killer throughout the West. The Telegraphers' Union, or Brotherhood, or Mystic Circle, or something or other, is once more making a struggle for existence. It is almost too soon for an attempt of that kind, for there are good memories among operators, and it is hardly to be expected that those who passed through such an ordeal as that resulting from the last strike, are yet sufficiently recovered to again risk a conflict with their employers, who in every instance have and always will win in such tests of strength. The Brotherhood is useless for anything but harm, and in the event of a strike is about equivalent to business suicide. As in the last strike there was but a limited number of men enrolled who had been through similar previous struggles, so in forming a new brotherhood it will be found that it is made up of new men; and the young operator who is importuned to enroll himself with these will find profit in seeking advice among the veterans of one or two telegraph or other strikes.

The Sperry Company is progressing rapidly with its huge exhibit on the tower of the Board of Trade. From a distance this will prove a beacon, and in the summer season will be seen far out in the lake. But around the immediate neighborhood of the lights, it can hardly be considered probable that the rays will be available. The extreme height of the illumination renders this impossible in theory. What the practical result may be will be chronicled hereafter.

A young electrician of the popular variety is in the dumps over an unfortunate Christmas present which he sent his lady love. His mind naturally combined science and utility, and he conceived the sublime idea of a pair of magnetic insoles for his darling's little "footsy-tootseys," these being highly recommended as shields against the inroads of jack frost. The indirect assumption that the damsel's vitality was below par was bad enough, but the accompanying lines "capped the sheaf," and the unfortunate author and scientist now has a mateless mitten to reward him for his gift and the accompanying screed:

"When these magic soles you tread,
Think of him whose love you be.
When in coming years we're wed
You may warm your feet on me."

—— Cleveland's lighting fund for 1886 only amounts to $100,000. The bids received from the electric, gas and vapor companies to light the city for the coming year as it has been for the past year aggregate $110,595. The gas companies were asked to reduce their bid from $19 to $18 per post, but refused. Mr. Morley president of one of the gas companies, attempted to give the Board of Improvements a history of the favors already granted the city by his company, but was interrupted by the Mayor, who reminded him that the franchise granted him by the city was a valuable one, and that if it was to be given over again the city would insist on receiving the light for the City Hall, parks, and markets free. The three lighting companies were then asked to make a *pro rata* reduction all round of 10 per cent. Harrison & Many, through the junior member, promptly agreed in behalf of the vapor light. Mr. Cook, of the Brush electric light, said that although his company were giving their lights free of charge on nights when the moon failed to shine, he would consent to the reduction if the others would. The gas companies refused to consent. Mr. Burnside moved that inasmuch as the city could be lighted the whole year around with electricity and gas, for $96,000—$4,000 less than the fund—that the Board recommend a contract with these companies. Mr. Carpenter seconded the motion, pending the consideration of which the Board adjourned.

—— The Hartford Electric Light Company has declared a quarterly dividend of 1½ per cent.

—— The Union Electric Company, 1 Ann street, this city, are about to commence the manufacture of electro-plating apparatus, and will give to all purchasers of their apparatus three practical lessons in plating.

—— Experiments have been made by the authorities of the German army to determine the illuminating power of the electric light on distant bodies. In these experiments the distance of source of light or arc lamp from the illuminated object, and the distance of the observer from the same, were both taken into account; that is to say, the total distance traveled by the rays from the lamp to the object, and thence (by reflection) to the eye of the spectator. It was found that with a distance of the object from the lamp of 8,000 meters, the observer could see it at fifty meters distance; with a distance of the object from the lamp of 6,000 meters, the observer could set it at 600 meters, and, when the former distance was only 1,500 meters, the object was visible at a distance of 4,300 meters. Other experiments made with a stronger lamp gave similar results; the greatest distance traversed by the rays being 10,500 meters, 4,500 of which measured the path of the reflected light, and the remaining 6,000 the path of the direct rays between the lamp and the object illuminated.

—— At the meeting of the contracting board, of Troy, N. Y., President Powers, Superintendent Cheeny and Joseph Powers of the electric light company appeared. President Powers explained that the construction of a new building interfered somewhat with the service so far given the city but he hoped that all the lights called for in the contract with the city will be burning next week. Mr. Powers said the contract with the city would expire in April, and if the city wished the company to light the whole town, taking 350 or 400 lights, a new contract would have to be made. The price now paid, 36 cents a light, is not enough, the lowest average price in other places being 48 cents. City Engineer Fuller was directed to correspond with other cities and get their figures and plans and specifications, and report at the next meeting. It is estimated that at least 350 lights will be needed. These, at the present rate of 36 cents per light per night, would make the cost of lighting the city $45,990 a year.

—— The Westinghouse Electric Company, of Pittsburgh, with $1,000,000 capital, has applied at the Pennsylvania State Department for a charter. The incorporators are George Westinghouse, Jr., C. H. Jackson, H. H. Westinghouse, John Dalzell, John R. McGinley, John Caldwell, Robert Pitcairn, all of Pittsburgh, and Frank L. Pope, of Elizabeth, N. J. Eighteen thousand shares of the capital, at $50 per share, subscribed for by George Westinghouse, Jr., are paid in full and are to be issued to him as full-paid capital stock in consideration of the conveyance by him to the corporation of letters patent, securing inventions relating to electricity; of the services of William Stanley, Jr., for two years from January 1, 1886, in experimenting in the field of electrical engineering with all inventions made therein; and of certain contracts with Fairbanks, Morse & Co., of Chicago, and with Westinghouse, Church, Kerr & Co., of New York, for the sale of appliances to be made by this company. Attached to the application is a list of the patents conveyed to the corporation by Westinghouse, which are all inventions of Stanley, and include the electric lamp, air pump, secondary battery, thermal-cut-out, apparatus for charging and discharging secondary batteries, armature for dynamo-electric machines, filament for incandescent lamps, induction coil, multiple incandescent electric lamps, socket for incandescent lamps, electric regulator and holder for incandescent lamps. There is also pending before the Commissioner of Patents, to be part of the plant, applications for patents for a system of electric lighting, armature for dynamo-electric machines, mercury pump, induction coil, electrical alarm indicator, attachment for dynamo-electric switch or circuit controller, and others of minor importance. The company will manufacture and deal in machinery and appliances for the generation, transmission and utilization of electricity.

ELECTRIC LIGHT NEWS

—— The Ball Electric Light Company are installing an additional thirty-light dynamo to the plant of the Plymouth Electric Light Company, at Plymouth, Mass. The satisfaction the first plant gave resulted in the additional order.

—— The manufacturers of the Brush electric light apparatus at Cleveland, O., have taken steps to prosecute the Thomson-Houston company, and users of the Thomson-Houston apparatus, for infringement of several of the Brush patents.

—— The Parker-Russell carbon has been in such demand as to keep the new factory of the company at St. Louis crowded with work. A new carbon is promised by this company, early this month, that will make happy the heart and eyes of the consumer.

—— The Milwaukee *Sentinel* says: Mazomanie is lighted to-night for the first time by the United States Electric Lighting Company, with the incandescent electric light. All the principal business blocks, residences and streets are furnished with the light. The light is a success.

—— A very neat and convenient pocket memorandum has been sent to their friends by Messrs. Holmes, Booth & Haydens. This company commenced this pleasant style of remembering their friends several months ago, and soon found they hadn't enough to go around, notwithstanding the large order manufactured, and hence a new lot are now being sent out, even more desirable than the former ones.

—— Incorporation papers of the Trenton Electric Light and Power Company were filed at the Essex County Court House recently. The headquarters are at Trenton and the company will do business all over the State of New Jersey. The capital is fixed at $30,000, of which $1,000 is paid up. Among the shareholders are James B. Dill, of East Orange; William C. Kerr, of Brooklyn, and William Lee Church, of South Orange.

—— An application has been presented to Judge Lubke, in the Circuit Court at St. Louis, by Henry Hitchcock, in behalf of the Western Union Telegraph Company, against the Guernsey & Scudder Electric Light Company. The proceeding is prompted by the alleged danger to life and property attending the electric-light wires. The Western Union company seeks to restrain the Guernsey & Scudder company from keeping its poles in close proximity to the Western Union poles on Locust, between Third and Fourth streets. At present a break in the new company's wires would cause the same to fall across the Western Union wires underneath. An order to show cause was granted, returnable this week.

—— Vincent Mangella and Salvador Torcicie, Italian organ grinders, were entertaining a large crowd with their music at the corner of St. Louis and Charles streets, New Orleans. While Torcicie was grinding out the music, Mangella waited by his side. He was leaning against the pole of the Louisiana electric light at the corner, when suddenly a flash of light was seen to descend the pole. He uttered one scream and fell forward. Torcicie caught his friend as he fell, and he, too, was knocked down. When the two men were picked up it was found that Mangella was dead, killed by a stroke of electricity, and that Torcicie's head was burned to a crisp by the same force. The strange feature of the case is that the Louisiana electric light has no power as yet, and it does not commence until next month. It is thought that the wire of another electric light company must have crossed its lines, or else a stroke of lightning descended.

ELECTRICAL PATENTS.

INDEX OF INVENTIONS FOR WHICH LETTERS PATENT OF THE UNITED STATES WERE GRANTED IN THE WEEK ENDING DEC. 29, 1885.

333,110 Electrical conductor; Edward Clark, Newburg, N. Y.

333,111 Conductor; Edward Clark, Jersey City, N. J.

333,131 Fire-alarm signal; Wm. J. Keenan, Boston, and Eugene M. Wilson, Worcester, Mass.

333,132 Electric device for setting clocks; James F. Kettell, Worcester, Mass., Sarah J. Kettell, administratrix of said James F. Kettell, deceased, assignor of one-fourth to Charles W. Sherburne, Boston, Mass.

333,133 Electric device for setting clocks; James F. Kettell, Worcester, Mass., Sarah J. Kettell, administratrix of said James F. Kettell, deceased, assignor of one-fourth to Charles W. Sherburne, Boston, Mass.

333,167 Signaling circuitt for telephone exchanges; Chas. E. Scribner, Chicago, Ill.

333,174 Dynamo-electric machine; Wm. Thomson, Glasgow, County of Lanark, Scotland.

333,178 Railway telegraph; Wm. Vogel, Chicago, Ill., assignor to Adolph Zeller, same place.

333,194 Electric arc-lamp regulator; Jacob Cain, Fort Wayne, Ind., assignor to the Fort Wayne Electric Light Co., same place.

333,219 Incandescent electric lamp; August Harding, Oakland, Cal.

333,289 Telegraphy; Thos. A. Edison, Menlo Park, N. J.

333,290 Duplex telegraphy; Thos. A. Edison, Menlo Park, N. J.

333,291 Way-station quadruplex telegraph; Thos. A. Edison, Menlo Park, N. J.

333,292 Voltaic battery; Desmond G. Fitzerald, Brixton, County of Surrey, and Thomas J. Jones, Princes street, Hanover Square, County of Middlesex, assignors to the Primary Battery Co., London, England.

333,298 Printing telegraph; Clarence L. Healey, Brooklyn, assignor to Stephen D. Field, Yonkers, N. Y.

333,394 Electrical conductor; Edward Clark, Newburg, and Theron A. Richards, Brooklyn, N. Y.

BUSINESS NOTICE.

National Electric Light Association.

Elgin, Ill., Dec., 18.

The annual meeting of the National Electric Light Association will be held at the Carrollton Hotel, Baltimore, on Feb. 10, 1886. Arrangements have been made with the proprietors of this hotel to entertain the delegates in attendance at the convention at $3 per day each. This is a rebate of $2 a day on the regular prices, and includes all the facilities afforded by the hotel—board, lodging, etc. etc. The convention will remain in session three or four days, affording ample time for the discussion of all the important subjects relating to electric lighting. The several committees appointed at our last meeting in New York are now preparing papers to be read at the coming convention upon the various topics of interest as designated at that time. It is earnestly hoped that every man or company engaged in the electric lighting business, will be represented at the meeting in Baltimore. Arrangements have been made for transportation at reduced rates, of which you will be advised in due course. Baltimore extends a most cordial welcome, and I trust that every interest engaged in electric lighting will be represented at this annual meeting. Let this be a royal gathering. Correspondence regarding this convention will be promptly considered and answered.

GEORGE S. BOWEN,
Chairman Executive Committee.

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Brooklyn Eagle,
Opperman & Muller, Turtle Bay Brewery,
Equitable Building,
New York Ferry Co.,
Tribune Building,
Press Club,
Delmonico's,
Hotel Brunswick,
Lotus Club,
Union Club,
Union Square Hotel,
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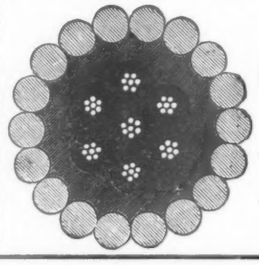
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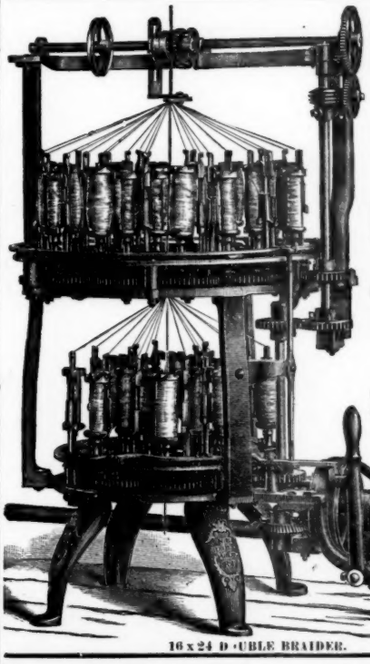

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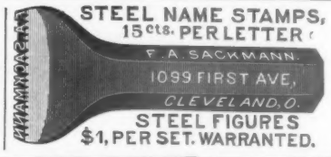

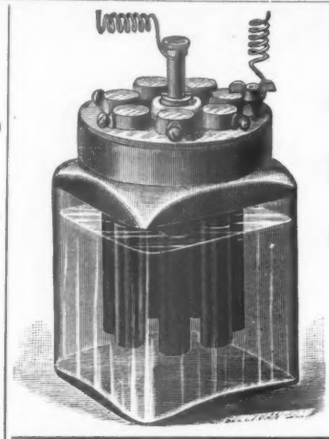

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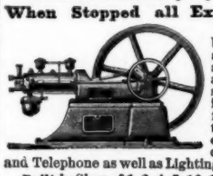

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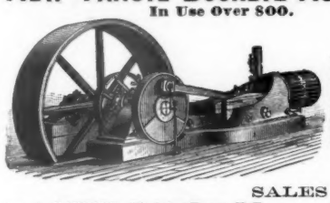

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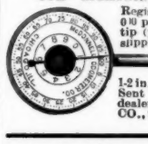

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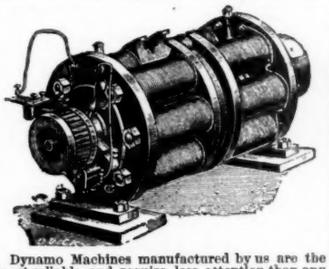

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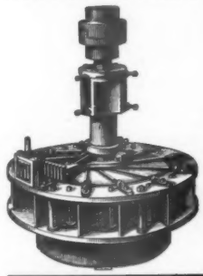

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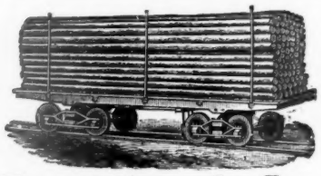

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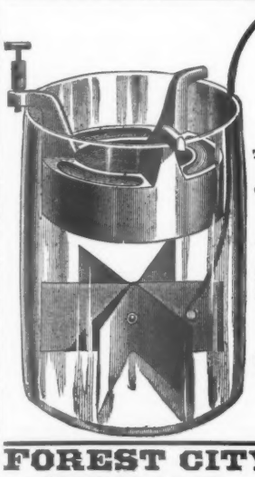

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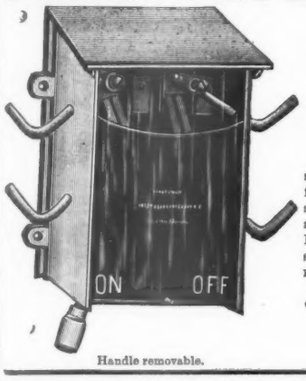

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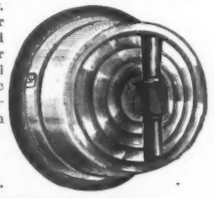

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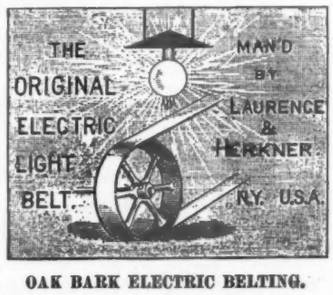

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